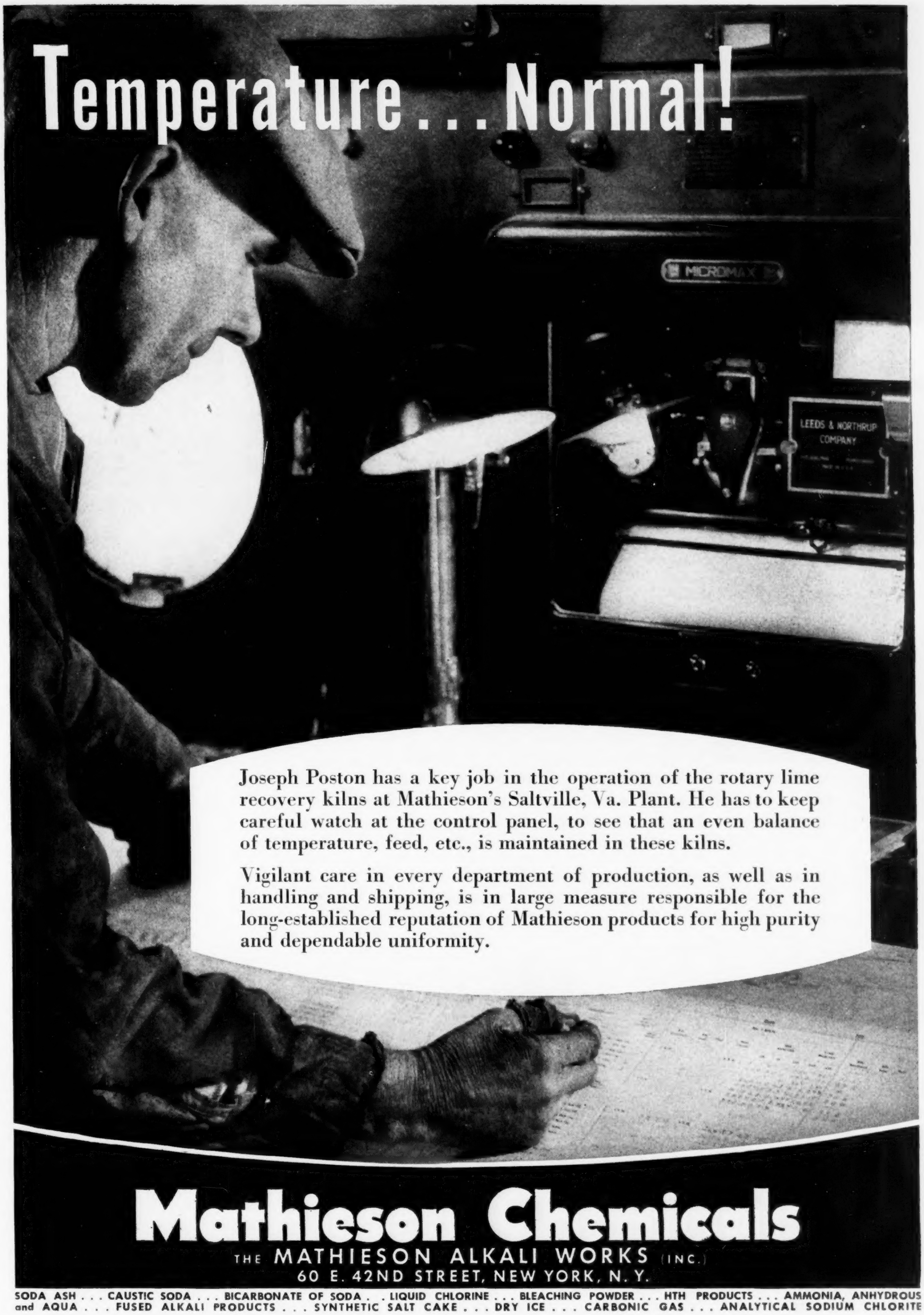
Temperature... Normal!
MICROMAX
LEEDS & NORTHRUP COMPANY
Joseph Poston has a key job in the operation of the rotary lime recovery kilns at Mathieson's Saltville, Va. Plant. He has to keep careful watch at the control panel, to see that an even balance of temperature, feed, etc., is maintained in these kilns.
Vigilant care in every department of production, as well as in handling and shipping, is in large measure responsible for the long-established reputation of Mathieson products for high purity and dependable uniformity.
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THE MATHIESON ALKALI WORKS (INC.)
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The Reader Writes—

Not "Liquid Rubber"

I've examined your Guidebook Number with a great deal of interest, and want to compliment you on an excellent job.

One thing I thought of, and in the interest of accuracy you may want to use the following information for future editions.

Your heading of "latex" is explained with the term "Liquid Rubber," and I believe the correct description, in common usage, would be "Natural Water Dispersions of Rubber." Then too, the most widely used commercial grades are: Normal 38-40% Latex; Concentrated 60-72% Latex. An 80% latex is not commercial and rarely ever obtained, if at all.

ARTHUR NOLAN,
Naugatuck Chemical Div.,
United States Rubber Co.,
New York City.

Wants Questionnaire

We are just in receipt of your latest edition "Buyer's Guidebook Number." We wish to congratulate you on the fine job you are doing, and thank you for our copy.

There's one matter, however, that we would like to call to your attention, and that is, that although we have been a regular subscriber to your CHEMICAL INDUSTRIES for a number of years, we still fail to find ourselves listed in your valuable book.

We would like to suggest that you send us a questionnaire or whatever is necessary, that we may be shown in your next edition.

WILLIAM LICHTENSTEEL,
Vice-President,
Apex Soap & Sanitary Corp.,
McKees Rocks, Pa.

Editorial Note: The Guidebook questionnaire record cards are not part of our subscription records. We, therefore, urge every company that is not listed, but like Apex Soap wishes to be, to write us requesting that a questionnaire be sent.

Splendid Suggestion

I would like to suggest that you have specialists write a series of articles on actual operating difficulties met and overcome in:—1. Evaporation; 2. distillation; 3. granulation; 4. screening; 5. centrifuging; 6. crystallization, etc.

HENRY G. FLIEGEL,
Long Island City, N. Y.

Wrong Initials

Congratulations again on your middle roto pages showing the A. C. S. Boston meeting. I have to revert to my old duty and tell you, however, that the gentleman at the lower lefthand corner of the right-hand page is Dr. F. W. Mohlman, not M. A. Mohlman.

FRANK C. WHITMORE,
Dean, School of Chemistry and Physics,
The Pennsylvania State College,
State College, Pa.

Analyze Other Markets

I thought Dr. Frederick A. Hessel's article on "Latin American Chemical Markets" covered the subject very well indeed. Why not an additional article or two taking up the possible export markets in other parts of the world?

REGINALD C. KIERNAN,
San Francisco, Calif.

Editorial Note: We are collecting statistics now to determine the value of such possible business.

Invaluable—Interesting

We find the "Guidebook" invaluable and the magazine most interesting.

ROBERT M. LEICH,
Charles Leich & Company,
Evansville, Ind.

Becalmed?

Although my former communications to you were antagonistic, I must admit that your December issue took the wind out of my sails.

The pleasure I derived from reading the host of informative articles it presented provoked me into writing this congratulatory letter.

I hope that I often become similarly provoked in the year to come.

TOBIAS R. KELLER,
City Chemical Corp.,
New York City.

An Excellent Recommendation

I find all departments of your magazine useful, and as I have said before, I find it one of the best technical publications that I have ever seen.

PAUL A. VICKERS,
Allen & Vickers,
Atlanta, Ga.

"We" Feel Highly Honored

Your copy of the Buyer's Guidebook Number has just arrived at our office.

On behalf of the Ohio State University, I wish to thank you for this book, and it will be placed at the immediate service of the Faculty of Chemistry.

WM. LLOYD EVANS,
Chairman, Dept. of Chemistry,
The Ohio State University,
Columbus, Ohio.

Editorial Note: Dr. Evans has just been chosen president of the American Chemical Society for 1941.

Likes Mineral Information

We find the Buyer's Guidebook Number very valuable in our work in connection with all types of minerals.

LESLIE C. MOTT, Secretary,
Mining Committee,
Los Angeles Chamber of Commerce,
Los Angeles, Calif.

Statistical and Technical Data

I think the data section furnished with your magazine is one of the finest pieces of informative material we get, and we make plenty use of it.

JOSEPH M. WAFER,
Industrial Chemical Sales Div.,
West Va. Pulp & Paper Co.,
New York City.

An Essential Tool

I want to congratulate you very much on the 1939 edition of the Buyer's Guidebook Number. I have had occasion during the last ten days to use this volume quite often and find it most helpful. In my mind it is one of the essential tools of anyone who has anything to do with either purchase or sale of chemicals.

FRED. A. HESSEL,
Ellis-Foster Company,
Montclair, N. J.

Where Is My Guidebook?

Replying to your communication please be advised the copy of the Buyer's Guidebook Number has not been received by the writer.

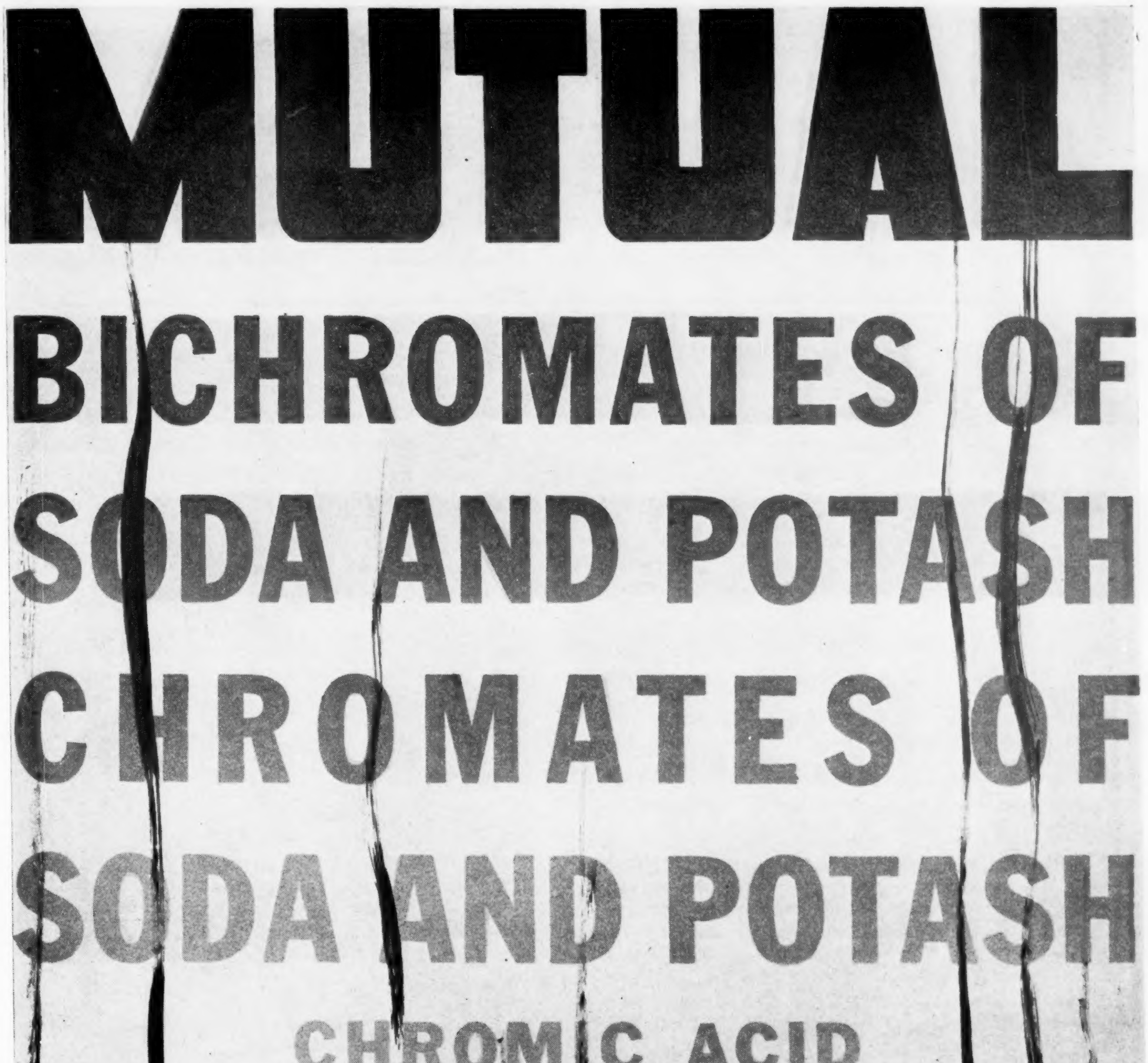
Considering its latent value it is hard to censure anyone for misappropriating it, but that hardly helps us who have found its pages of the greatest value.

JOHN M. HARNEY, President,
Harco Chemical Company,
Newark, N. J.

Not Even One Suggestion?

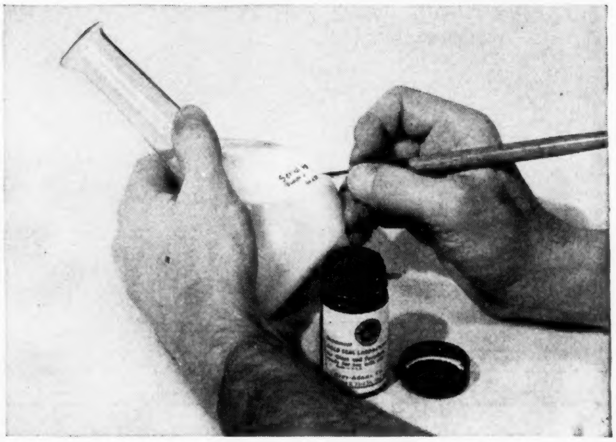
Sorry—but I can't offer even one suggestion for improving your excellent periodical.

E. P. BALLING,
The Lumino Co., Inc.,
New York City.


MUTUAL
BICHROMATES OF
SODA AND POTASH
CHROMATES OF
SODA AND POTASH
CHROMIC ACID
OXALIC ACID
Mutual Chemical Co. of America
270 MADISON AVENUE, NEW YORK

LIFE on the

(*Above*) **NEW DEVELOPMENTS** keynoted American Chemical Society's booth at the Seventeenth Exposition of Chemical Industries last month. In photo 1 are shown the parts of the new glass centrifugal pump, developed for the handling of many types of corrosive liquids. Photo 2 shows four new products made from sulphite waste: a tanning extract, a fixer for cement, vanillin, and sodium lignin sulphonate, a water-treating chemical. Photo 3 shows new rubber filter media. One type is made with a definite size and number of pores; a second with a large number of microscopic openings. Photo 4 shows set-up for demonstration of water treatment with new sodium hexametaphosphate, also used to "soften" milk so it will not curdle.

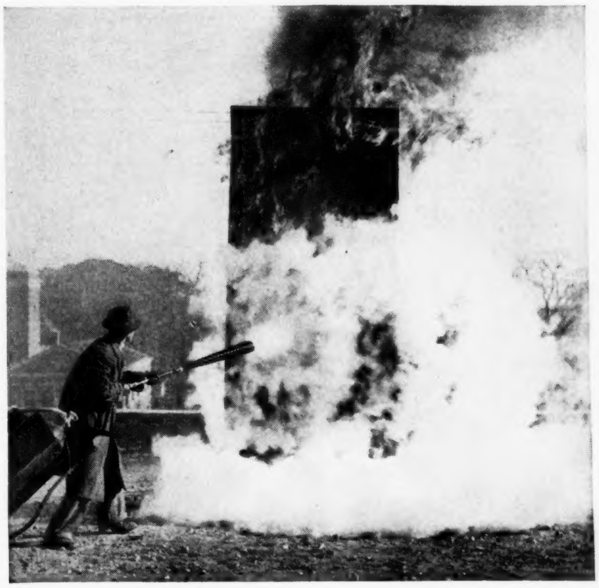


(*Above*) **PERMANENT INKS TO WRITE ON GLASS** are a boon to chemists and laboratory workers. Non-acid, non-corrosive, and opaque, they are newly developed by Clay-Adams Co. The formulation of inks calls for steady improvement in raw materials—and Cyanamid research keeps pace with the demand.

(*Above*) **SMOOTHNESS OF PAINT FILMS** is subjected to searching investigation by this delicate apparatus, which will detect irregularities as small as one-millionth of an inch. Cyanamid aids the paint industry to set the highest standards with such products as REZYL‡, PHENAC*, BEETLE‡, and TEGLAC‡ Resins.

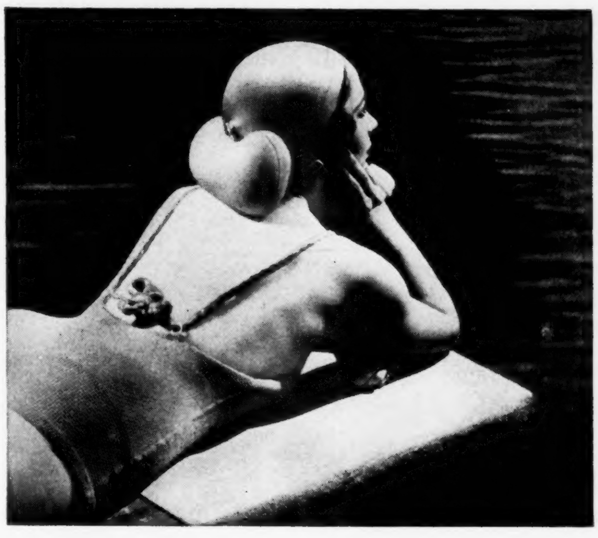
(*Right*) **PAPER AND PLIOFILM "CAN"** is the latest wrinkle in food packaging. Developed by Bensel Brice Corp., package gives visual display of "canned foods", and offers new outlet for products of paper and rubber industries. To both these industries Cyanamid supplies many essential chemicals—and offers technical cooperation.

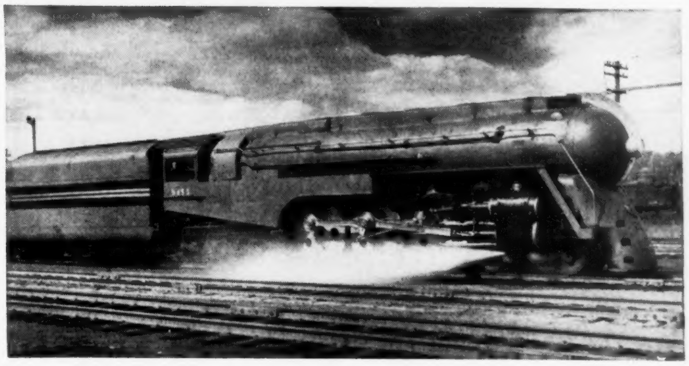
Chemical Newsfront



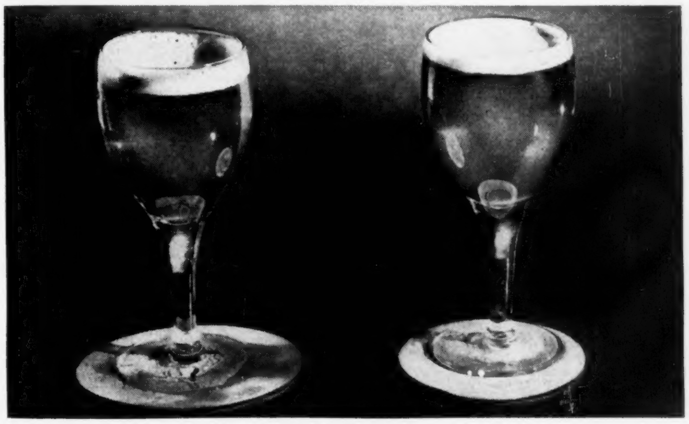
(*Above*) **FIGHTING CHEMICAL FIRES** is a job that chemicals take on with marked success. Recent development is the use of pulverized dry ice (solid carbon dioxide). Effectiveness of the carbon dioxide "snow" in smothering gasoline fires is shown in this photo of the snow being sprayed on a flaming panel which was soaked in gasoline before being ignited.

(*Below*) **NEW RUBBER BATHING CAPS** that help keep wearer afloat come to the fore as the Florida season gets under way. Growing importance of the mechanical rubber goods field has featured the development of the industry—and with it have come new problems in compounding. Cyanamid's line of AERO▼ BRAND chemicals helps in difficult problems.





(*Above*) **NEW CHEMICAL AID TO RAILROADS** that may save $2,000,000 a year is the combination of sodium dichromate with an alkalizing agent to inhibit corrosive effects of brine drippings on equipment, track and bridges. Laboratory tests, reports Association of American Railroads, indicate good potentialities; service tests, it is hoped, will confirm them.



(*Above*) **FOAMING BEER GLASSES** usually leave plenty of moisture in their wake. But stand one on a coaster treated with AEROSOL|| Wetting Agents (see glass at right), and the coaster absorbs the moisture far faster than an untreated one (left). An unusual application, but typical of the rapid wetting properties of AEROSOL, which have won wide acceptance for it as an agent for reducing surface and interfacial tension in many industrial applications.

AMERICAN CYANAMID & CHEMICAL CORPORATION

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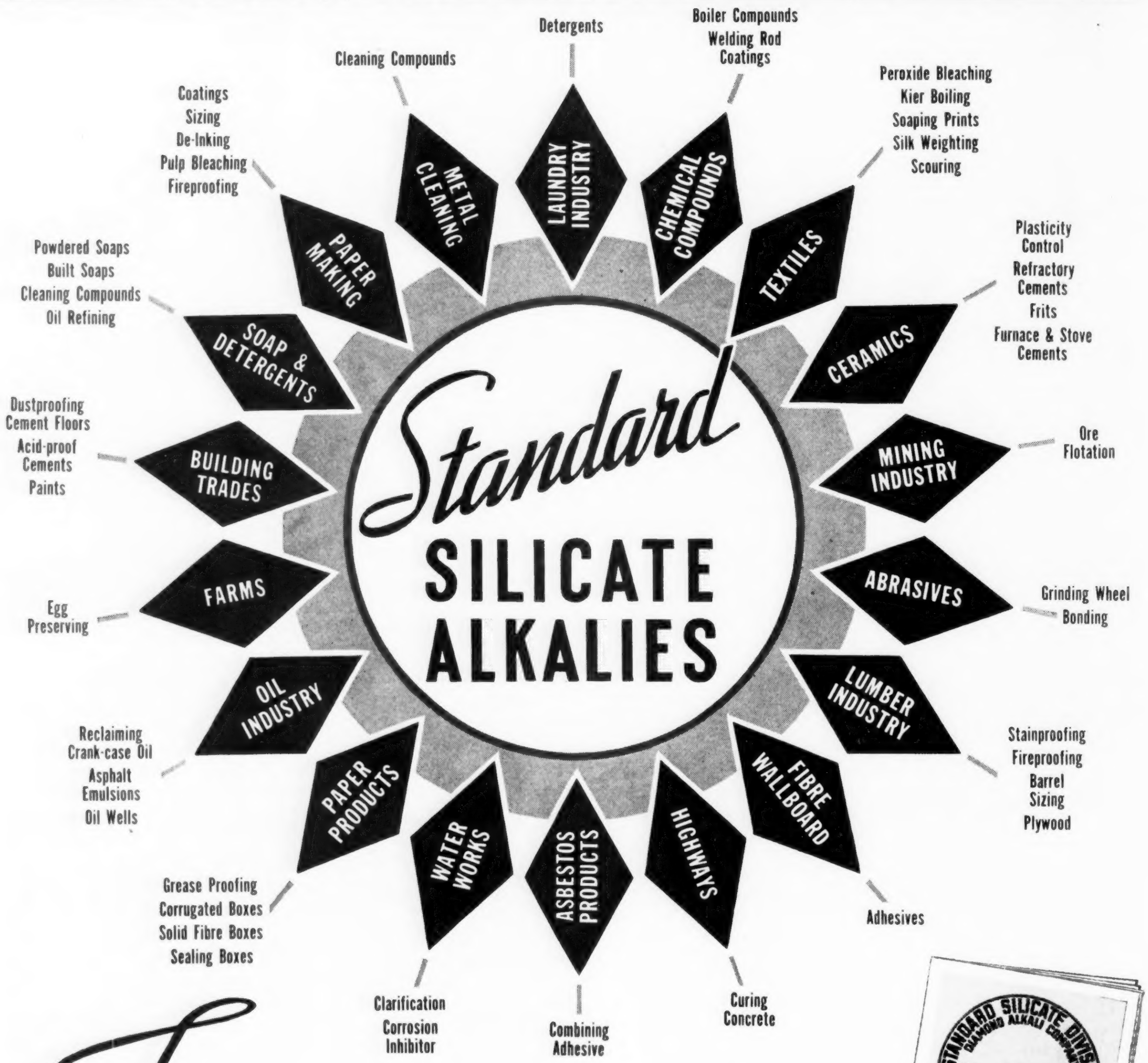
AMERICAN CYANAMID COMPANY PRODUCTS

*Trade-mark of American Cyanamid & Chemical Corporation.
‡Registered trade-mark of American Cyanamid Company.
▼ Registered U. S. Patent Office.
||Trade-mark of American Cyanamid & Chemical Corporation applied to wetting agents of its own manufacture.



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C-1

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CHEMICAL
INDUSTRIES
The Chemical
Business Magazine
Established 1914

Repercussions of Reciprocity

NO storm cloud hovering over the coming session of Congress appears more threatening of political disturbance than the Hull trade treaties. Opposition to the reciprocity program has been banking up slowly, and the Chile treaty drew flashes of more than "heat lightning" from the powerful mining state Senators. Growing rumbles of thunder have been heard for the past two years over both in agricultural and labor areas.

All this is formidable political power, and if industry has suffered in silence, the mining, farming, and working groups are increasingly outspoken. Senators Wheeler and Johnson have objected with vigor to chopping down the tariff barrier protecting domestic copper and their argument of a miner's daily wage of $6 U. S. against $1 Chile has the support of both Messrs. Green and Lewis. The Grange, strongest numerically of all farm organizations, repeated their stand against treaty trades at the expense of agricultural products and demand that the American foodstuffs market belongs to the American farmer.

Already the State Department has begun its defense of the reciprocity policy and cleverly opened a bold offensive against what Assistant Secretary Grady branded in a radio speech as "excessive and preferential tariffs, restrictions, quotas, exchange manipulations, and government-controlled foreign-trade monopolies."

Such a high and mighty position is an uncomfortable one to hold, for the radical group of the New Deal has been guilty of all these heinous sins. The Administration has manipulated exchange by 40 per cent. depreciation of the dollar. They have given a 25c per bushel export bounty on wheat. They have dumped cotton abroad under government monopoly. It will be difficult to defend reciprocity on idealistic grounds while the Administration plays practical politics with such devices as these.

Editorial

The Chemical Exposition

The 17th Exposition of Chemical Industries held last month at the Grand Central Palace in New York was one of the most successful of the series and certainly was the one most productive in the last decade of new business for the exhibitors. Despite a stricter admission policy on the part of the management, over 40,000 attended, a figure very close to the all-time record of the last ten years.

Chemical manufacturers, it appears to us, are "missing a bet" by their failure to participate in greater numbers. The few who did report satisfactory results, but several executives did express the opinion that lack of broad participation by the industry detracts seriously from the value of the show to chief chemists, buyers of chemicals and others not primarily concerned with equipment.

The chemical manufacturing industry does not lack suitable material to exhibit profitably at the Exposition. In 1933 at our booth we displayed 263 new chemicals placed on the market by our advertisers in the two previous years; last month we showed over 400. At each of the last three expositions our booth was crowded day and night by visitors seeking data. At each exposition this display developed hundreds of worthwhile inquiries for chemical makers.

There is no doubt but what tremendous latent possibilities exist. We do not presume to know the answer to just what form any new program should take. Perhaps a definite chemical section, dramatizing the industry's contribution to the industrial advancement of the country, or, perhaps, an entire floor devoted to chemical displays, or possibly a show without equipment displayed and held in alternate years may be the best solution.

For several reasons it may not be desirable to attempt to do a general public relations job for the industry at such an exhibit. But there is a "chemical public." With this group there is the distinct possibility of improving the industry's relations, plus a golden opportunity for the companies participating to develop valuable inquiries for old and new chemicals and particularly the latter.

With the recent show still fresh in our minds the time is now opportune for individual and company expressions of opinion on the subject.

Foreign Patents

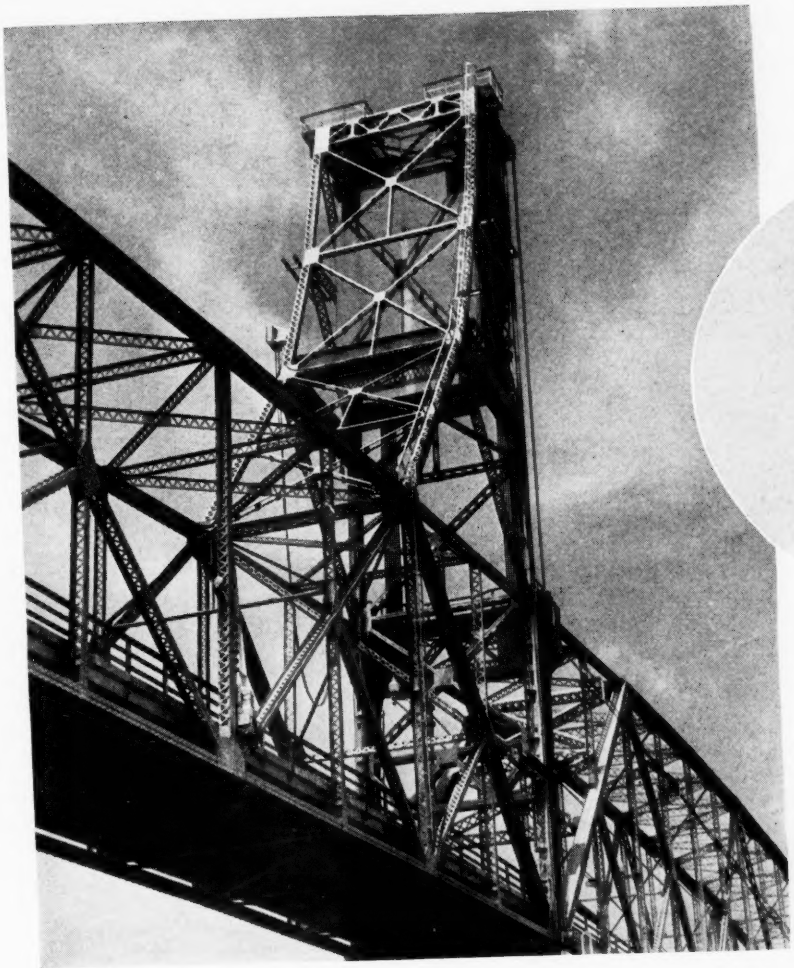
Six years ago CHEMICAL INDUSTRIES began publication of abstracts of United States patents on chemicals and products allied to the chemical field and two years ago the method of presentation was further improved by including the digest in the Statistical and Technical Data Section. When one considers that in the past year the Official Gazette of the Patent Office contained 43,030 patents, the value of such a digest service for the chemical field is more readily appreciated.

The response of our readers has been such that this service is now extended to cover patents granted in Canada and the European countries that are leaders in the chemical field—England, France, and Belgium. Germany was to be included in the plan, but present conditions make it unlikely that the necessary data could be obtained with sufficient regularity to insure uninterrupted service. This new department, directed by E. L. Luaces, New York chemical consultant, will fill a long-needed want. Suggestions and constructive criticisms of the method of presentation will be welcomed.

Conflicting Dates

Several unfortunate conflicts in dates of meetings and affairs in the chemical and allied fields have occurred in the past six weeks and several other possible conflicts were only avoided by last-minute changes by committees in charge.

Because of the broad editorial coverage of CHEMICAL INDUSTRIES, several readers have suggested that the paper act as a clearing house for such information. This is a worthwhile service and, accordingly, all of the associations and societies on our records have been asked to cooperate. In this month's Statistical and Technical Data Section is printed as complete a schedule for the next twelve months as could be prepared at this time. Each month, beginning in the February issue, there will appear a Calendar of Events covering the next 60-day period.



COATINGS 1919-1939

By
John Marshall

In coating structural steel, protection of the metal from corrosion is of prime importance. All photographs, unless otherwise mentioned, courtesy of Du Pont.

The author is chemical director of the Finishes Division, E. I. du Pont de Nemours & Co., Inc., Wilmington.

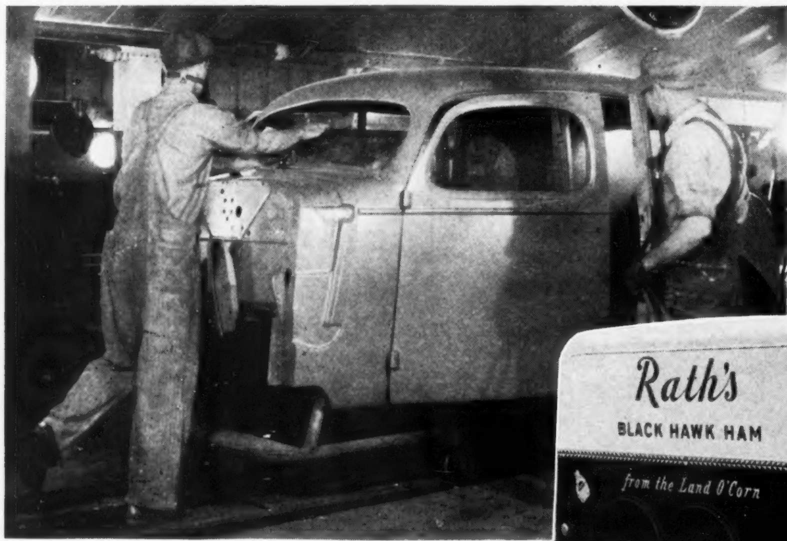
THE manufacture of finishes, with an annual value up to $500,000,000, as shown in Table I, is essentially a business of assembly. Some manufacturers produce for themselves some of the pigments, vehicles, and solvents used in the industry, but many of the materials of the business are supplied from sources independent of the finishes industry itself. As is the case with any assembly industry, the history of the development of the industry over a given period is inseparably linked with that of the parts that go to make up the final assembly. And so, the story of the past twenty years of the finishes business is in a considerable measure the story of the development of new pigments, new film-forming materials, and new solvents; sometimes developed and manufactured within the industry, and sometimes developed and manufactured in separate institutions which have become sources of supply for the industry.

TABLE I
Value of Finishes Produced
(From U. S. Census of Manufacture)

Year	Total Value
1919	$340,346,803
1923	404,134,231
1927	519,009,842
1931	299,788,874
1935	349,788,826
1937	435,395,953

At the same time, the development of new raw materials for an industry is futile unless the industry itself is so equipped that it can evaluate and commercialize the new raw materials that may become available. The past twenty years in the finishes industry has an astonishing history of development along this line. At the beginning of the period few concerns were equipped to take advantage of improvements in their raw materials. Twenty years ago, research work on finishes was to a considerable extent concentrated in the laboratories of the suppliers of pigments and oils. Today, many units in the industry, large and small, have well equipped research organizations aggregating many hundreds of trained chemists and engineers who are getting answers to questions regarding synthesis of vehicles, dispersion of pigments, the mechanics of the drying of films and the control of these and other phenomena which make possible the utilization of materials and economy producing methods that were previously unthought of. So, whereas manufacturing processes were once under the control of artisans on a rule of thumb basis, they are today, more and more coming into the realm of chemical control, with its regulation of conditions of manufacture and elimination of variables which were causing loss of efficiency both to manufacturer and consumer. In the sales field also, the past twenty years have seen a tremendous evolution from a system in which the customer largely dictated his requirements, to be met by rule of thumb formulating methods, to a system in which the supplier of finishes supplies a technical service to the customer which results in improved application methods, and in the utilization of radically new materials, even at the expense of costly changes in customers' plants.

In short, the past twenty years has witnessed the transformation of the finishes industry into a chemical business in the true sense of the word. Instead of being an industry in which a few prophets were crying in the wilderness, appealing for a better understanding of fundamentals, it is today a live, highly organized, highly competitive business in which



Spraying bodies in an automobile plant. Modern lacquer reduced finishing schedules from days to hours. Photograph, courtesy, General Motors Corp.

On delivery trucks and other commercial vehicles, finishes are used for protection of the surface and for advertising value achieved through decorative effects.

keen scientists are vying with each other in the improvement of their products, in the translation of such improvement into customer economy, and in reduction of costs of manufacture. It is impossible to estimate what all this has accomplished for the ultimate consumer, but some of the effects can be sensed in the story of the accomplishments of the past twenty years which follows.

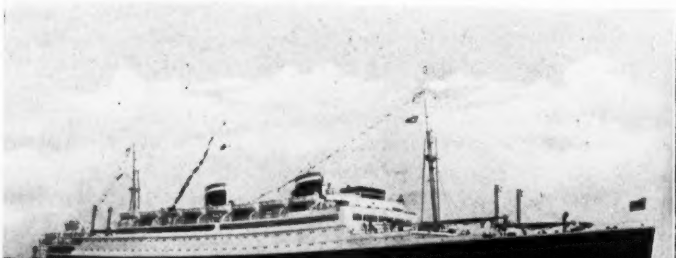
Before attempting this story, it is worth while to outline briefly what the finishes business is.

Finishes are coatings applied to surfaces for purposes of preservation, or of decoration, or both. In the case of structural steel, protection has in general loomed large, and decoration has been less important. In the case of houses, both factors have been important. In the case of automobiles, decoration has been highly desired and protection is needed only for the mechanical life of the car. In the case of refrigerators, decoration is highly important, and protection has been against peculiar conditions such as condensation on cold surfaces, resistance to kitchen greases, and resistance to abrasion and hard knocks. In the case of small metal household objects and many articles of furniture, decoration is paramount, and protection of little importance. And in every case, the consumer has needed economies either in materials or in application costs that would make him competitive in his own field.

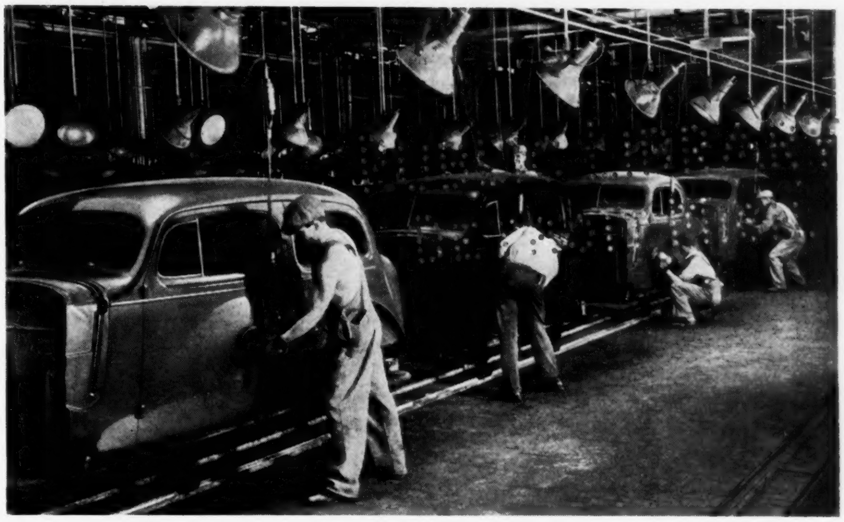
The task of the paint chemist has, therefore, been to work out combinations of materials which would deliver the most economical combination of decoration and protection to meet the needs of the individual case, within the restrictions regarding application properties (including speed of drying) that would fit the product to the customer's system of finishing.

A finish in general is made up of three parts. The pigment is there to provide obscuring value and decoration, and in some cases is an important element in protection. Then there is the binder, which has the function of cementing the pigment particles together and to the surface being coated. Obviously, the life of the binder controls the life of the film. Finally, there is the solvent, which serves to put the actual film composition into such physical condition that it can be conveniently applied to the surface being coated. This sounds relatively simple. However, it is worth pointing out that the binders in use are in general non-homogeneous materials, having a wide range of molecular complexity; for example, a single sample of nitrocellulose may have individual particles in it ranging in molecular weight from 20,000 to 120,000. The drying oils and resins, synthetic and natural, have similar lack of homogeneity. These binder materials are dispersed by solvents, and into such dispersions the pigment itself is colloidally dispersed. (Brownian movement can easily be observed.) It might be interesting to the reader to take any modern text book on colloidal chemistry to see what is given on the subject of this type of solution, and this type of dispersion. He will find a great deal on water solutions of glue and

Modern finishes have improved the appearance and reduced the cost of maintenance of ocean liners, pleasure craft and streamlined trains.



casein, but an amazing dearth of information on the field of non-aqueous colloids in which the great majority of finishes belong. It is sufficient to say that this is a field in which apparently insignificant variations have amazing physical effects. Traces of metallic soaps have tremendous effects on drying speed. The presence or absence of traces of water may make the difference between a smooth flowing liquid and a gel. Many similar examples could be cited to give a clue to what the paint chemist has faced in attempting to gain control of his business.



Polishing finished automobile bodies. Modern coating materials have added years of life and beauty to car finishes. Photograph, courtesy, General Motors Corp.

Twenty Years Ago and Today

Twenty years ago the white pigments in use consisted of white lead, zinc oxide, and to some extent, lithopone, then a relatively new combination of zinc sulfide and barium sulfate. The colored pigments were for the most part chemical dry colors such as the lead chromates, Prussian Blue, various iron oxides, and a small number of lake colors such as Para Red and Toluidine Toner. Today, the industry has in addition, antimony oxide, many varieties of lithopone, titanium oxide, and all of its varieties, chromium oxides and hydrates, organic yellows, a host of organic maroons, and many others.

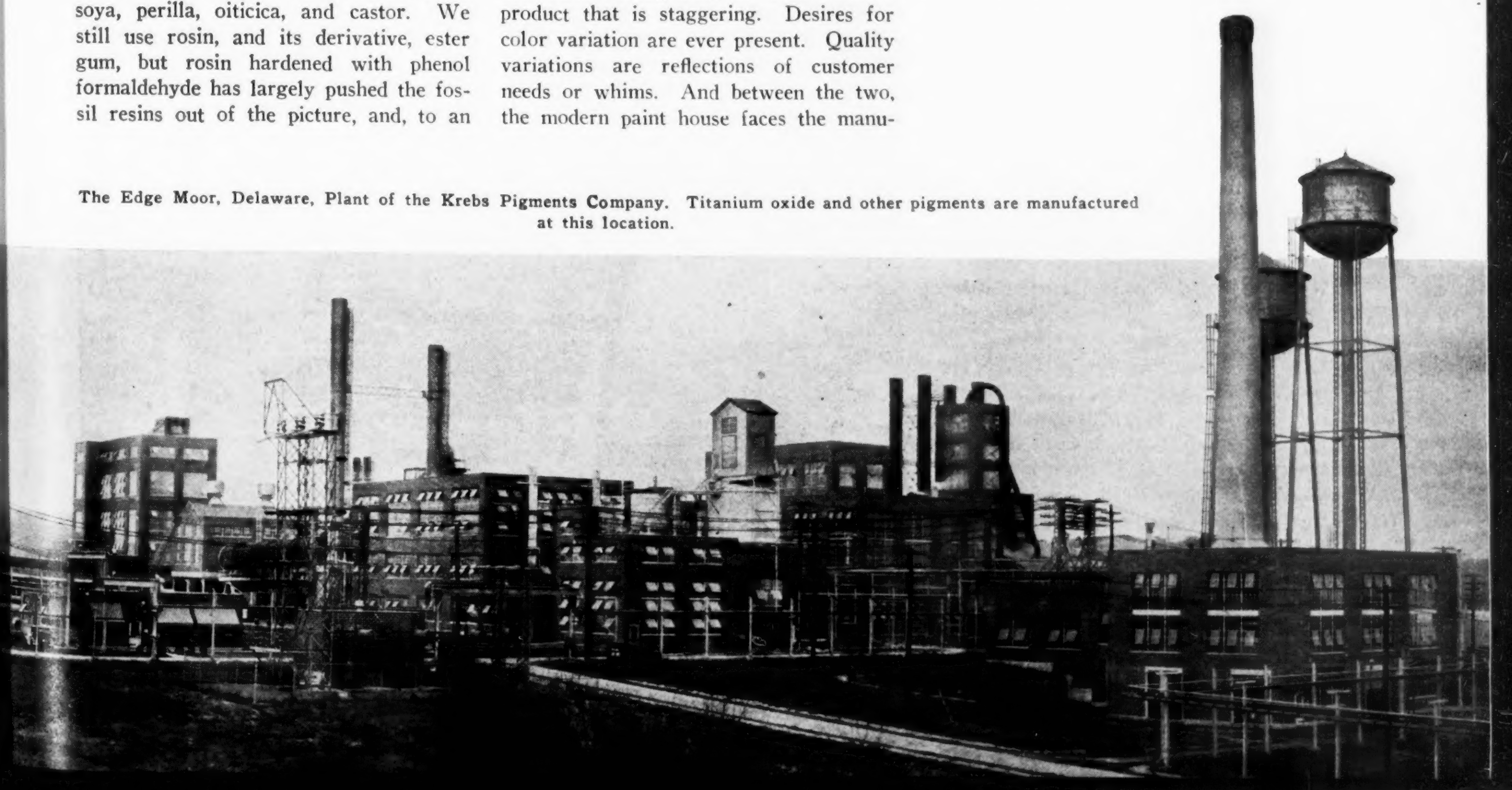
Twenty years ago the binders consisted of raw or heat treated (bodied) linseed oil and heat treated China wood oil. Both of them were used in combination with various natural resins, such as rosin, or the imported resins, often fossilized, such as Congo, Kauri, and Manilla. In fact, the supplying of vehicle ingredients for the old finishes industry was a most interesting example of the reaching out of commerce into the obscure regions of the earth for its supplies of raw materials. Today we still use linseed and China wood oil. To the list have been added soya, perilla, oiticica, and castor. We still use rosin, and its derivative, ester gum, but rosin hardened with phenol formaldehyde has largely pushed the fossil resins out of the picture, and, to an amazing extent, nitrocellulose combined with various plasticizers, and resins of the alkyd and phenolaldehyde type have pushed their way into the field.

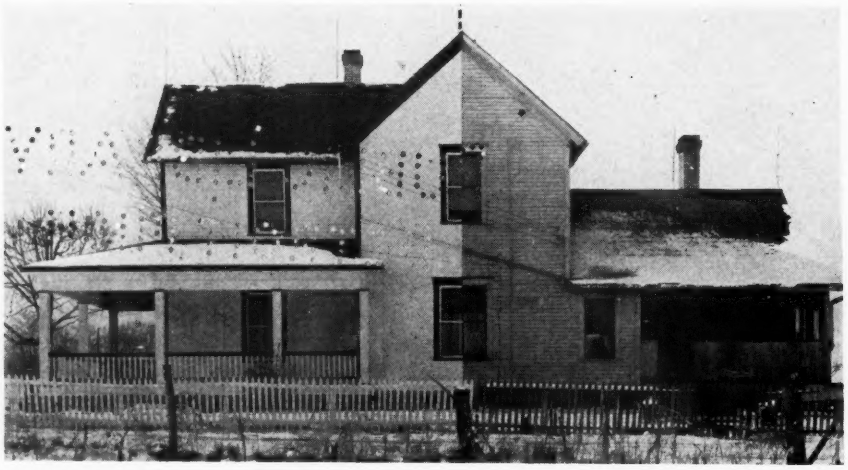
Twenty years ago, mineral spirits constituted the principal solvent of the industry, with turpentine still an important factor. Today we have high solvency petroleum solvents made from new types of crude oil, or by new and strange chemical processing of petroleum by-products. We have aromatic solvents of all boiling ranges. We have alcohols, esters, and ketones of varied constitution and boiling points.

In short, the paint industry of today has literally thousands of individual raw materials to select from, and the large paint house using upwards of 1,000 raw materials in its current manufacture is the rule, rather than the exception. And with this plethora of raw materials is associated a complexity in list of finished product that is staggering. Desires for color variation are ever present. Quality variations are reflections of customer needs or whims. And between the two, the modern paint house faces the manufacture currently of perhaps 20,000 different items, which may at times be packaged in anything from a half pint can to a tank car. Is there any wonder that the financial heads have sometimes shaken dubiously at the entry of chemistry into a business that had once been reasonably self-satisfied with a fair simplicity based on the long-time experience of rule of thumb artists?

The first shock to the finishes industry came in the early 1900's when China wood oil became a standard commodity. This material, because of its rapid drying properties, wakened the industrial consumer to the possibility that finishing schedules could be sped up to the point where mass production methods might become possible. At the same time, it brought into the industry certain pioneer chemists who began to preach to the manufacturers of finishes the possibility of

The Edge Moor, Delaware, Plant of the Krebs Pigments Company. Titanium oxide and other pigments are manufactured at this location.





In the cases of houses, both protection and decoration are important. Improvement in both is obvious in this house which has been half painted with a modern finish.

profit by change, and who began foundation work in the preparation of the industry for change.

The transition to a true chemical industry actually began at the beginning of our present history. In 1919, existing more or less as a small stepbrother of the finishes business was a nitrocellulose lacquer industry, consisting of 10 establishments, selling about 500,000 gallons of product to the value of $1,000,000 per year. Their product went to various minor uses such as the coating of metal hardware, and the coating of gas mantles. Due to the low solubility of nitrocellulose, its compositions could be applied only in thin films. Durability against the elements is directly related to film thickness; and because of high solvent usage and multiplicity of operations nitrocellulose lacquers were too expensive to use where thick films were needed. Also, when its solubility was increased by chemical treatments, nitrocellulose became too brittle for successful use. So the prospects for its expansion seemed limited. In 1921, limits were established within which solubility could be increased while retaining flexibility and with this development was associated the discovery of practical methods of treatment both of nitrocellulose per se, and of the large quantities of smokeless powder which were thrown on the market at the end of the world war. The tabulation on this page shows what happened as a consequence.

TABLE II

Year	No. of Establishments	Gallons of Lacquer & Lacquer Thinner	Value	% of Total Finishes
1919	10	500,000	$ 923,464	0.27
1921	17	1,409,280	3,093,862	1.30
1923	41	3,255,857	6,944,366	1.72
1925	106	12,267,206	27,254,796	5.71
1927	175	30,386,168	60,269,673	12.42
1929	206	45,702,055	82,336,227	16.20
1937	206	46,817,113	72,361,461	....

(Figures from Biennial Census Reports)

Automobile Mass Production

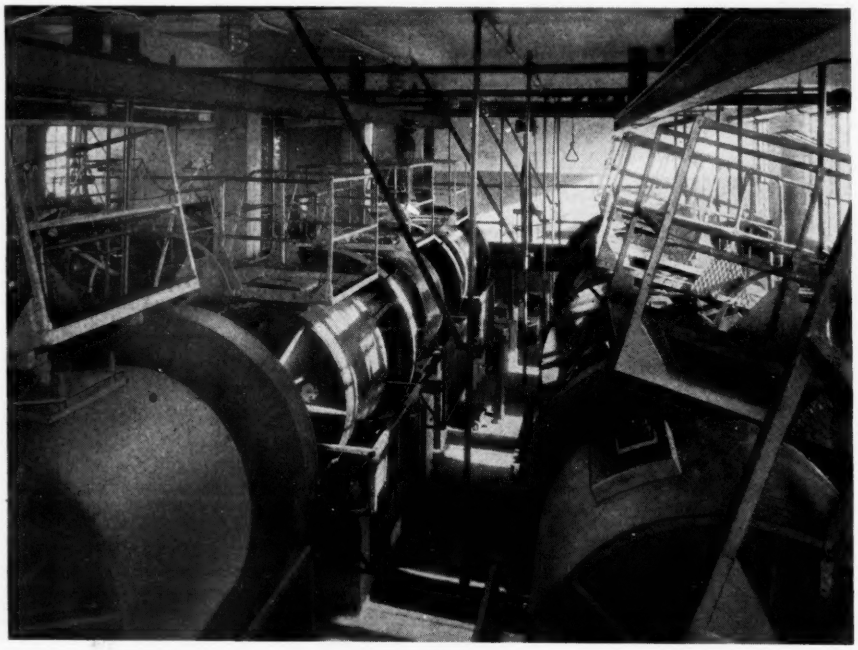
Prior to 1921, the new and struggling automobile industry had been attempting to fit its finishing system to a mass production basis. In trying to do this, the drying time of the varnish enamels then in use had been forced down to and below the danger point from the standpoint of protection and retained appearance, and had still not accomplished the purpose. Like a drowning man reaching for a plank, the automobile manufacturers seized on the newly developed lacquers, with their superior durability and appearance, and with their extremely rapid finishing schedules, and as a result completely revolutionized automobile finishing methods to the advantage both of themselves and the public.

By 1927, the new lacquers had taken hold in a wide variety of other fields. They were being used for furniture, for mechanized refrigerators, and for many metal and wooden objects. They were even sold largely to the householder for brush application in the home. And incidentally, from a proportion of ¼ of 1% they now represented 16% of the finishes sold in the country.

This development produced a rush on the part of many finishes manufacturers to form chemical organizations and the revolution was on, both in establishing competition in the new lacquers and in developing improvements in oleo-resinous finishes. During the 20 years in question work in the lacquer field has been continuous and great strides have been made in the further improvement of quality and cost. As a by-product of the development came a tremendous expansion in production of aromatics, alcohols, ester solvents and plasticizers.

Research was stimulated along several distinct lines. In 1926 production started in America of combinations of rosin and phenolformaldehyde which made possible the formulation of varnishes (solutions of resin in heat treated oils) having much improved drying speeds for a given flexibility as compared with the older fossil gum or rosin combinations. In the field of household colored enamels these new products made steady headway, and the greater part of such enamels are now made with this type of resin, supplied

Grinding floor in a modern paint plant.



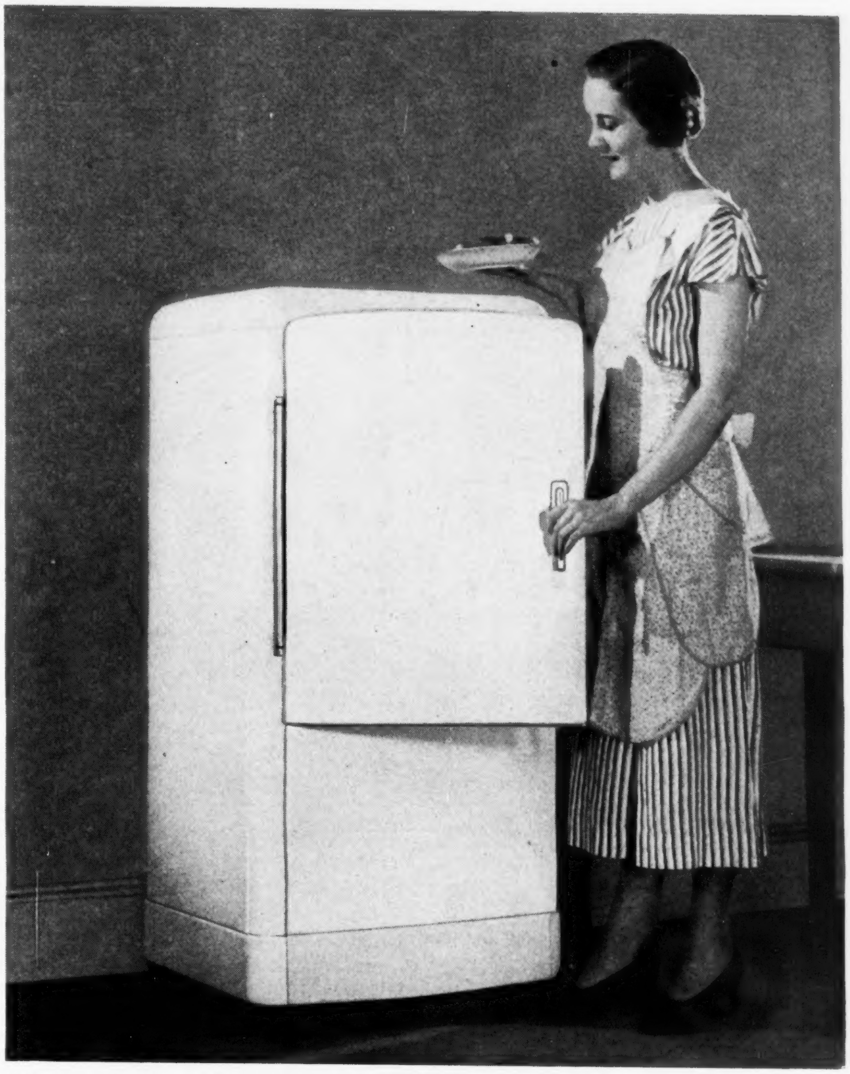
from a number of competitive establishments. In the field of industrial finishes similar compositions have established a firm place on a smaller scale.

A shock to the industry almost as great in magnitude as that produced by the lacquer development began to be commercially effective in 1928. Paralleled, and in some respects antedated, by outside agencies, one of the units of the finishes industry began research in 1924-1925 in the field of monobasic acid modified glyceryl phthalate resins. At first the idea was to produce resinous materials for use in nitrocellulose lacquers, but early in the work it became evident that modifications of gyceryl phthalate with the acids of drying oils had interesting film forming properties in themselves, and by 1928 enamels based on such resins, popularly termed alkyds, had appeared on the market. These new film formers proved to have resistance to the weather of the same order as the best nitrocellulose lacquers, coupled with a drying speed similar to the more brittle varnishes made from phenol-formaldehyde-rosin combinations. In addition, they possessed an amazing toughness and flexibility.

As time has gone by these finishes have made a place for themselves lying between that of the lacquers and the oleo-resinous products (including the phenolic finishes). Their chemical resistance and toughness introduced them into the refrigerator field, where they displaced lacquers completely, and made tremendous inroads into the porcelain finish that was being widely used. By 1936, 90% of the mechanized refrigerators were being coated with enamels made from alkyd resins, with surprising savings to the customer and with satisfaction to the ultimate consumer. The resistance to the weather of alkyd enamels took them first into the finishing of commercial vehicles and into the automobile refinishing field, and later into the factory finishing of several makes of automobiles. This same property of durability carried them into the finishing of structural steel, signs and machinery. The properties of toughness and hardness combined carried them into the finishing of many miscellaneous articles such as typewriters, kitchen furniture and equipment, and the like. The properties of whiteness and retained whiteness carried them into the field of high grade household and architectural enamels.

The table on this page indicates the growth of the use of Alkyd Resins.

Practically all of the above production was consumed in finishes. Estimating two pounds to the gallon of finish, this indicates for 1937 a production of 30,000,000 gallons of finish of the alkyd type, to an estimated value of at least $50,000,000. Here again, therefore, is a chemical development constituting in 1937 about 12% of the total volume of the country in finishes, and with acceptance steadily growing. A direct by-product of this development was the introduction into the industry of large quantities of high solvency petroleum solvents, to supplement the inadequate supplies of aromatics.



Finishes on modern refrigerators and household appliances must resist grease, moisture condensation and hard knocks to which they are subjected during their lifetime in a kitchen.

TABLE III

	No. of Makers	Pounds Produced
Prior to 1929	1	Relatively small
1929	3	1,000,000 (estimated)
1933	6	9,930,705
1934	10	15,299,247
1935	15	34,312,713
1936	31	46,952,452
1937	39	61,254,019

(Figures from Report No. 131, U. S. Tariff Commission)

Mention has already been made of the phenol-formaldehyde-rosin complexes that played such an important part in the replacement of fossil resin in the industry, and which constituted the first successful solubilizing in vegetable oils of phenol-formaldehyde. In 1928 appeared the first really successful solubilizing of such types of resin without the use of resin. This was in the form of resins made from synthetic complex phenolic compounds and various aldehydes, which had the property of dissolving quite freely in China Wood Oil to form varnishes of surprising drying speed coupled with inertness to weather and to various chemical agencies, though with less flexibility and toughness than alkyds of similar durability. The use of these materials has also grown steadily. While they have not achieved the tremendous volume of the lacquers or of the alkyd products, they have produced a marked advance in finishes for use under certain extreme conditions; for example, for marine varnishes, for underwater conditions, and where extreme alkali and acid conditions are a factor.

The most recent important addition to the binder picture lies in the urea-formaldehyde resin field. This type of resin had been used for many years in

plastics, but had resisted attempts to make it sufficiently soluble for finishes. In addition, it was extremely brittle, which rendered it an unattractive candidate. In 1937, however, as the result of synthetic work in the laboratories of a finish manufacturer, the first commercial finishes containing this type of resin appeared on the market. In a measure, this type of finish is an adjunct of the alkyd field, since the materials used for flexibilizing it are of the alkyd type.

Finishes containing this resin in considerable proportions are characterized by the ability to force dry at an amazing speed, and broad utilization of this property may be made in the further development of mass production methods in various industrial uses. The resin is made from chemicals now being produced in large quantity from atmospheric nitrogen and water gas. Statistics are not yet available as to the extent to which this resin has penetrated the finishes industry. It has the possibility, however, of becoming a factor of great importance.

The development of the finishes field as an outlet for synthetic resins has stimulated an enormous amount of additional research effort, aside from the items already mentioned as having played an actual part in the revolution that has been going on. Some of these, such for example as Tornesite (Chlorinated Rubber), Pliolite, and certain of the Vinyl resins may be considered offshoots from the Plastics Industry and have achieved important specialty uses. Other Plastic offshoots are under extensive examination, e.g., the methacrylates, the acryloids, the vinyl acetals (Formvar and Butacite), ethyl cellulose, cellulose acetate, cellulose aceto-butyrate, and polystyrene. Although it is difficult to say when the saturation point on new developments in the resin field will be reached, it is obvious that the field for investigation is still large and activity is keen. And with it all is coming the assurance that the chemists of the finishes industry are growing in their ability to determine quickly the possibilities of each new binder material when it appears.

So far all discussion of the developmental history of the past 20 years has been confined to film forming or binding agents. Coincident with this development structure, and completely enmeshed in it as a matter of fact, there has come from the pigment industry a steady stream of new white pigments which have had a profound effect on the effectiveness of the development of film formers.

The following tabulation, taken from Bureau of Mines & U. S. Tariff Commission publications, indicates what has happened with the more commonly used white pigments since 1927. Unfortunately, information on titanium pigments is not available.

It must be recognized that all the above production is not used in finishes. Much of it goes into floor covering, rubber, and other industries It is evident, however, that something has happened to white lead, zinc oxide and lithopone. The answer undoubtedly lies in titanium oxide, which has found its way into many important fields. It will be noted that during the years 1927 to 1933 the use of lithopone went up in comparison with that of white lead and zinc oxide. During this period, lithopone was gradually replacing white lead as an ingredient of wall paints and in industrial finishes with gains from the standpoint of economy, whiteness, and health hazard. Since 1933, the use of lithopone showed a shrinkage, due undoubtedly to the advent of the titanium pigments.

TABLE IV

Short Tons of Production

Year	White Lead	Zinc Oxide	Leaded Zinc Oxide	Lithopone
1927	151,695	151,246	26,064	176,994
1929	147,031	160,611	27,149	206,315
1931	97,368	95,700	18,577	151,850
1933	72,982	98,542	22,868	140,831
1935	96,831	99,697	29,976	159,486
1937	98,213	114,652	40,343	154,771
1938	96,800	79,100	38,200	124,900

Titanium oxide has intense whiteness, combined with a hiding power approximately three times that of the other pigments. The trend of its actual use has, of course, been related to its cost per unit of hiding as compared with the other pigments. Its high hiding power brought its adoption first in gloss finishes for one coat purposes, and it was almost from the start an ingredient in the alkyd finishes, where the reactivity of lithopone prevented the making of durable products. Later it went into the gloss and flat wall finishes, where it displaced lithopone, the pigment which had already displaced white lead. Later still, it went largely into the house paint field, where it has given improvements in hiding power, whiteness, retention of appearance, and ultimate durability. Obviously, the finishes industry has carried a large research load in adapting the new pigments and in working out processes of manufacture.

It is interesting to note that production of leaded zinc oxide has shown appreciable increase since 1935. This is perhaps due to the fact that this pigment is usually associated with titanium oxide in the modern house paints. Titanium pigments have also found extensive usefulness in the lacquer field.

Reference has already been made to the increase in the range of colored pigments that has taken place in the period in question. Coupled with this, and resulting from cooperative effort of pigment supplier and finish manufacturer, has been a steady improvement in quality, light stability, flooding tendencies, ease of dispersion, texture, and many other properties.

The story of development of the past 20 years is not complete without a word on actual manufacturing process. Twenty years ago, the well equipped paint manufacturer had a number of Buhrstone mills for his grinding, with perhaps a simple roller mill for grinding flat paints. His paints were mixed in small sized mixers, often by hand. His vehicles were supplied from small coal-fired open varnish kettles, operated by varnish makers who were a law unto themselves. Filling was usually by hand. Today, many factories are supplied with ball and pebble mills, or with high speed 5-roll mills. Dispersion processes involving heavy duty dough mixers are often in use. Vehicles are supplied from elaborately controlled, indirectly heated varnish or resin making kettles. Filling out is mechanical. In fact, the whole thing has become a streamlined operation, economical of labor and capable of control. And the effect is seen in the steady increase that has taken place in the confidence of the consumer in his product and its supplier.

There has been no product of the finishes industry of real importance that has been left untouched by these changes of the past twenty years. As a result of chemical effort and financial courage, house paints are more durable, have more beauty and have greater economy to the user than ever before. Interior enamels and wall finishes hide better, have faster drying by hours, have more brilliant and durable colors, and improved economy to the user. Improved appearance, improved durability, and lower costs have been given to the finishes on fabricated wood and metal articles and furniture. Refrigerators and automobiles now have finishes which are in keeping with the high mechanical quality of the articles themselves. Exterior varnishes have many times the durability of the older products. Synthetic mill whites are giving whiteness, retention of whiteness, and ease of cleaning never before considered as a possibility. Everywhere there has been improvement in quality and the lowering of real cost that comes with improved service—with the resulting benefit to the finishes industry, and, more important, to the public at large.

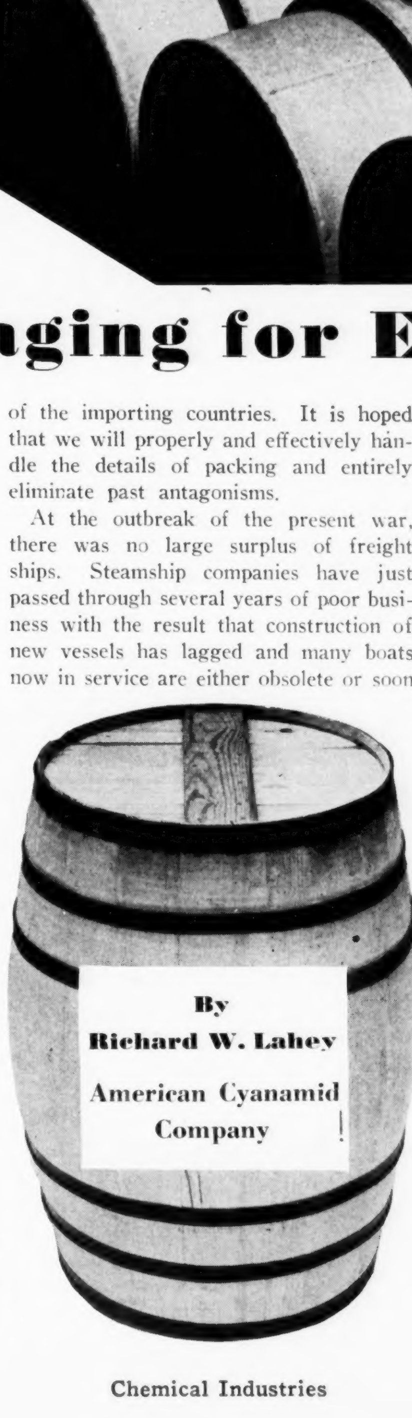
Bulk Packaging for Export

DURING the early years of the present century, when our export business increased rapidly, and again in the period during and immediately following the last war when exports reached the highest totals on record, the losses from damage which were due to faulty containers and packing assumed staggering proportions. These losses resulted in increased freight and insurance rates and caused an added burden on export shippers. Of far greater importance was the fact that faulty packing created an antagonism to American made products which immeasurably increased the difficulties of the American exporter in obtaining business formerly supplied by foreign manufacturers. These were the findings of the United States Department of Commerce as expressed by Thomas E. Lyons, Chief of the Transportation Division at the Ninth Packaging Conference of the American Management Association held in New York last March.

We again have an opportunity to show foreign importers that the United States exporters can supply products packed in containers that will adequately stand the hazards of export shipments and that we can mark, label and brand our containers in accordance with the laws and customs of the importing countries. It is hoped that we will properly and effectively handle the details of packing and entirely eliminate past antagonisms.

Photograph above shows export shipment in drums ready to leave the St. Louis plant of Monsanto Chemical. Barrel photograph courtesy of *The Wooden Barrel* Magazine.

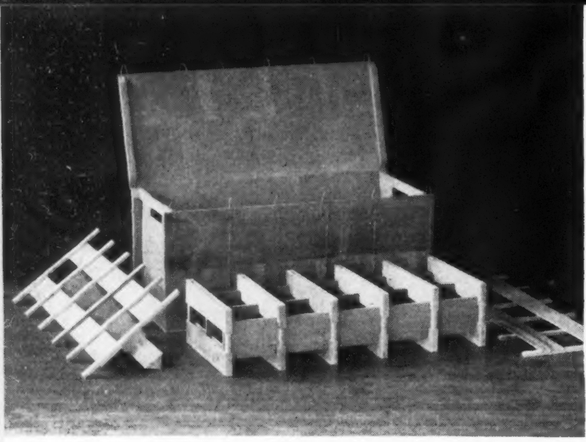
At the outbreak of the present war, there was no large surplus of freight ships. Steamship companies have just passed through several years of poor business with the result that construction of new vessels has lagged and many boats now in service are either obsolete or soon will be. This may be further complicated by the proposed neutrality legislation now under consideration by the Congress. Consequently, there is not enough space available to carry the existing tonnage to be moved. In their attempt to keep up with the export tonnage, ships are working stevedores day and night, loading and discharging which frequently results in extremely rough handling of merchandise and greater damage.



By
Richard W. Lahey
American Cyanamid Company

The choice of proper containers for export shipment requires a detailed knowledge of many factors, all of which are obtainable at the expense of considerable time and effort. The accumulation of these data may lead to sizable savings as a result of choosing containers which reduce import duties, ocean transportation costs and marine insurance. Among the many important considerations are:

1. *Strength of Containers.* A domestic container must have a considerable margin of safety to withstand the increased abuses and hazards of export transportation. Assume that a shipment has arrived at a United States port from the interior which might be the maximum trip of a domestic container. The container is then moved from the pier or lighter to the hold of a ship by slings or nets. This involves possibilities of dragging the load along the floor before hoisting, the possibility of hitting the side of the ship or hatchway and finally the



All-Bound Box, Specification No. 841, to carry ten 5-pint bottles of acid. Photograph shows assembled box and interior packing. This and other photographs on this and next page, courtesy of Col. James A. Walsh, Packaging Research Laboratory, Rahway, N. J.

jolt from landing of the draft in the hold. As extra loading time means lost income, this is all accomplished by the stevedores in a minimum of time and at the expense of the containers.

When the container arrives at its destination port it is liable to be accorded much worse treatment, as the facilities of foreign ports are often poor. In some instances, steamers must discharge cargo into lighters due to shallow water. It is not difficult to imagine the difficulties of making a soft landing of a sling load of merchandise with the lighter bobbing up and down and the boat rolling.

A knowledge of these conditions and foreign port facilities will enable the wise shipper to use the proper and most economical containers.

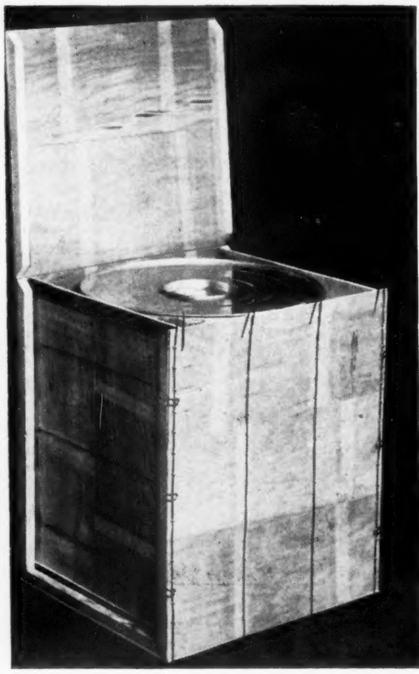
2. *Protection from Contamination, Spoilage, etc.* Extreme temperature changes, high humidity, salt air and rodents often require extra protection such as better coatings for containers, better closing devices and the incorporation of a lining or coating which is resistant to the transmission of moisture vapor.

3. *Containers and Customs Charges.* Choice of containers play a part in the customs duties assessed by some countries. Practically all duties are assessed on the basis of value or weight. If the latter, it may be net weight, gross weight or legal weight. Legal weight is commonly described as the net weight plus its immediate wrapping or inner container such as a bottle or tin can. Naturally, the gross weight assessment requires the lightest container. Some countries that use the net weight basis, set an arbitrary allowance for tare for a commodity and this allowance may be different when the article is packed in different containers. A knowledge of these practices can often save a considerable sum.

Customs costs may be increased by fines assessed because of incorrect weights, improper marking of containers or errors in preparation of consular documents. All instructions contained on the consignee's order should be strictly followed as they have had a definite purpose and the shipper assumes responsibility if they are not followed.

4. *Containers and Freight Rates.* Ocean freight rates are usually based on a gross weight or outside measurement basis, whichever produces the higher revenue for the steamship company. Irregular shaped containers, such as barrels are measured as though they were rectangular and are figured by their greatest outside dimensions.

All-Bound Box, Specification No. 700, containing drum to hold 200 lbs. of phenol.



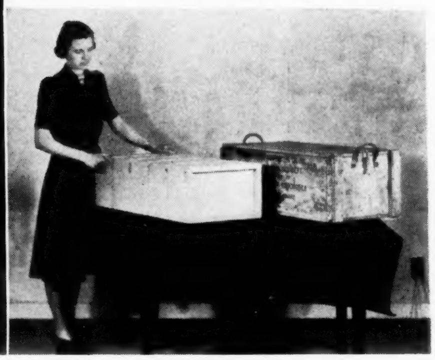
The container which most closely approaches the shape of a cube is the most economical from point of view of cubical contents.

5. *Containers and Marine Insurance Rates.* Losses resulting from pilferage, breakage, leakage and non-delivery are partially if not wholly controllable by the shipper through his choice of the container, choice of inner linings and marking on the container. Losses are not always distributed among all shippers as rates are sometimes based on the individual shipper's records. A careful shipper may therefore enjoy better rates than his careless competitor.

6. *Packing to suit Customer's Needs.* The experienced exporter always follows all instructions of the importer as to type of container, size, marking, etc. Such instructions are based on the customs, the transportation and handling facilities of the country and on the requirements for low import duties. In certain instances, the container has a salvage value and this is taken into account in the price.

The varying conditions of discharging vessels, handling, customs duties, freight rates, insurance rates, and customer's requirements, along with the heavy handling of merchandise caused by the present emergency in shipping conditions, precludes economical recommendations of *standard* specifications for containers. Certain recommendations can be made for specifications which should prove adequate for ordinary handling conditions but no guarantees are given that such containers will prove sufficient in strength to resist all possible abuses or that they will prove economical enough where reasonable treatment is encountered.

All-Bound Box, Specification No. 901, and nailed box, each containing 32 one-lb. bottles of acid. Contrast with the heavier box shown.



A. *Dangerous Articles.* Containers as prescribed by the Interstate Commerce Commission for the transportation of dangerous articles are recommended for export shipment of such materials. Exporters who do not have to ship by domestic railroads to reach the vessel's side should use care in the choice of containers to be in conformity with the Bureau of Explosives' Tariff No. 3 publishing Part 5 of the Interstate Commerce Commission regulations applying to such substances and also such navigation laws, rules and regulations as are promulgated by the Bureau of Marine Inspection and Navigation, Department of Commerce, bearing upon the shipment of so-called dangerous articles. Steamship Company's Conferences also have rules in effect regarding such substances and if the movement is to proceed via either the Panama or Suez Canal the authorities regulating the transit of the canals also have regulations regarding dangerous substances. The Board of Marine Underwriters, New York City, have certain requirements affecting the transportation of such articles. It is to be noted that varying and duplicating regulations exist in movements of this kind via water, but the Department of Commerce through its Bureau of Marine Inspection and Navigation has under development a proposed set of regulations intended to simplify the requirements in this field. These regulations are as yet in the preliminary stage, but among other requirements they propose to make mandatory the use of

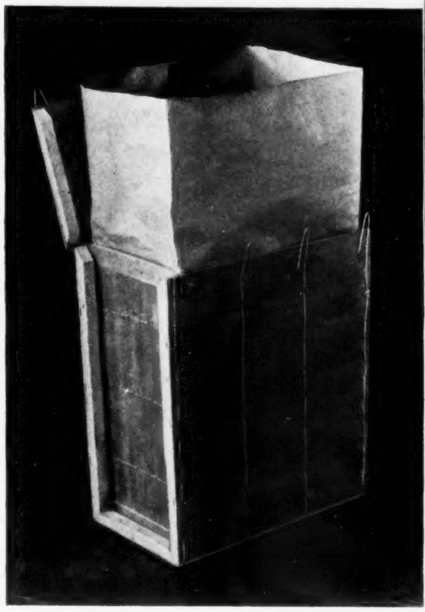
Interstate Commerce Commission specification containers for such articles.

These proposed regulations broaden the list of dangerous articles to include all liquids flashing between 80° F., the upper limit for inflammable liquids as defined by the Interstate Commerce Commission, and 150° F. These liquids between 80° and 150° F., are classified as combustible liquids and they require the use of special labels and contemplate the use of containers additional to the Interstate Commerce Commission specification containers such as the Consolidated Freight Classification Committee's regulations for steel barrels and drums under rule 40 and fiberboard boxes under rule 41 as well as providing for stowage on board vessels. The use of labels to identify such articles to steamship crews and the special stowage requirements are to be commended and it is understood that Interstate Commerce Commission specification containers will be required for only those specific materials that shipping experience shows to be necessary.

B. *Non-dangerous Articles.* The vast majority of export tonnage falls into this classification and here the shipper has as a guide only the specifications of the Consolidated Freight Classification Committee (Rules 40 and 41.) required for rail shipment. The following suggested specifications for specific containers may be helpful to the inexperienced export shipper.

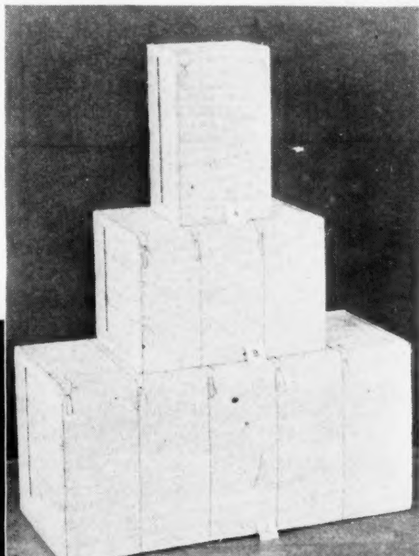
(1.) *Slack Barrels.* For weights up to 400 pounds tongued and grooved staves of first quality are recommended. Hoops should be of the steel band type preferably galvanized to prevent corrosion. Hoops should be well driven and permanently fastened by staples or hoop keeps.

All-Bound Box, Specification No. 805, to carry ten 7-lb. bags of a dry chemical. Asphaltum bag liner shown.



(Prick punched hoops will not hold as well.) Added strength can be obtained by the addition of two steel band quarter hoops to the usual four hoop barrel. The bilge should not be too large (76" circumference in a $19\frac{1}{8}''$ x $30''$ barrel) as the high bilge barrels are weaker containers. It is better to use a larger standard bilge barrel than to obtain the added required capacity by the use of a large bilge.

Heads should be of number one quality wood, one piece glued or tongued and grooved and glued heads are preferable although more expensive. If heads are secured by nailing, the nails must be driven horizontally into the center of the head. There is a stapling device for this purpose which is positive in driving the staples horizontally into the center of the head. Heads should be supported by wood battens which are shaped at the ends to conform to the shape of the chime of the barrel and should be fastened in a direction at right angles to the direction of the joints of the head. They can be fastened by nailing through the chime hoops and staves or by the use of wire strapping at each end which is brought down over the chime of the barrel and under the chime hoops. For exceptionally heavy loads some shippers use a piece of strapping which goes over the battens and completely around the barrel but under the hoops. Thus the heads are securely fastened.



All-Bound Boxes designed to carry miscellaneous shipment of chemicals.

Paper liners should be of the all-way stretch type which will withstand greater abuse than the single stretch type. If needed for protection, asphalt laminated liners can be readily obtained.

(2) *Tight Barrels.* There are very few changes required in the domestic tight barrels to fit them for export shipments as they are especially rugged containers. This barrel should be made of thoroughly seasoned and well kiln dried staves and heading and should be substantially made. Although some domestic barrels are equipped with six hoops it is recommended that eight hoop barrels be used for export shipments. It is good practice to use bung straps to hold the bungs in place.

(3) *Textile Bags.* The regular burlap bags used for domestic shipments should be strengthened by the use of heavier or stronger burlap and the strength of the sewing thread used in making the bags should be increased. In most instances, burlap which is two ounces heavier should prove adequate and all bag manufacturers use the extra heavy sewing twine for export or other special bags. The added strength of the cloth can sometimes be obtained by the use of goods of special construction. Some burlap which is woven

All-Bound, Specification No. 905, containing 13-gallon carboy.

with a larger number of threads in one or both directions is considerably increased in strength with little or no increase in weight.

Type of Loose Liners

Loose liners should be of the all-way stretch variety and if protection from the transmission of water vapor is necessary, this type liner can be obtained with a layer of asphalt between two plies of creped paper known as "duplex."

Sometimes bags with the creped paper laminated to the burlap with asphalt are preferred because the liners of these containers can withstand more abuse than the loose type. The same recommendations apply for the export bag of this construction, namely, heavier or stronger burlap than the domestic container, extra heavy sewing twine, or cementing seams

The use of fiber drums for export has expanded rapidly. Shipment of chemicals ready for export at Jersey City Works of Mallinckrodt Chemical.

with latex and all-way stretch paper liners. The asphalt in these bags sometimes causes them to stiffen in cold weather and this increases the likelihood of snagging and tearing of the bags The bag manufacturer should be cautioned to provide as much flexibility as possible by proper choice of asphalt and if two layers of asphalt and two plies of creped paper are used, replace the outer asphalt layer with rubber latex for greater flexibility. This is an important consideration as the snagging possibilities of bags are greatly increased when subjected to handling into boats by slings.

The same suggestions apply where cotton bags are used.

Bags should be closed by machine or hand sewing. If the latter method is used, care should be taken to assure sufficient slack remains as it is easier to hand sew a bag without leaving slack than to provide the extra outage required. Wire tieing is not recommended for export shipment as this type of closure is not as satisfactory as sewing although some shippers have been using this method with success.

(4) *Multiwall Paper Bags.* It may surprise some shippers to learn that a large volume of powdered products is exported in multiwall paper bags. Large quantities of cement and other products are regularly shipped to foreign countries in five and six ply paper bags. These containers of the proper construction to withstand the added transportation abuses of water shipment will carry to destination with a minimum of breakage and under existing burlap bag price levels will effect a handsome saving.

The recommended construction for the export container is six plies with a total basis weight of paper in all plies of 300 to 330 pounds. If moisture protection is required this can be obtained by the use of one or more plies of asphalt laminated or asphalt infused sheets.

The bags should be of the valve type or be closed by sewing or sewing and taping. Wire tieing is not recommended as it does not provide as much strength as the sewed closure.

(5) *Steel Drums.* All returnable steel drums which are usually 16 gauge or heavier are adequate for export shipments if they are in good condition.

The drums commonly known as single trip containers for dry or pulverized materials should be constructed of steel of the following minimum gauges:

Contents	100	lbs.—26	gauge	steel	or	heavier
"	200	" —24	"	"	"	"
"	400	" —22	"	"	"	"

The drums must be properly fabricated with welded side seams for the heavier loads preferred and closures efficiently fastened. If friction lids are held with channel clips, these clips should be drilled so clips can be held in place by tieing with wire.

The regular domestic 18 gauge 55 gallon drum for liquids has proved adequate for export shipments. Where transportation charges on these drums are figured on a volume basis, slight changes in measurement can effect savings. The tabulation below shows how this can be done.

In figuring volume, steamship companies consider all fractions of ½ or more as the next highest number while fractions of less than a half are omitted.

(6) *Fiber Drums.* There are three important advantages which fiber drums enjoy as export containers for dry or powdered products.

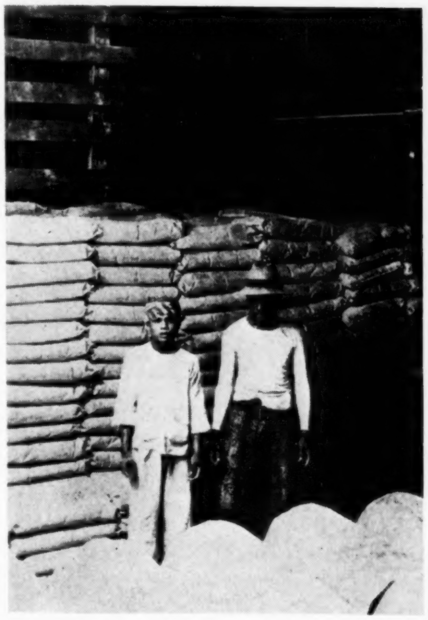
a. They are lighter in weight than steel drums or slack barrels and thereby are of particular interest where import duties are assessed on a gross weight basis.

b. They are impervious to the distinctly unfavorable storage conditions aboard ship, thereby maintaining their original attractive appearance.

Drum	*Capacity*	*Outside Height*	*Outside Diameter*	*Height of Rolling Hoops*	*Cubic Space Displacement*
Domestic	55 gals.	34 7/8"	24"	3/4"	11.6 cu. ft.
Export	55 gals.	35 3/16"	23 7/16"	7/16"	10.7 cu. ft.

Improper method of stowing bags. Note careless piling. Bags piled in this haphazard fashion are apt to shift easily. They are also difficult to unload. Bags should not have been piled against steel bars shown in background.

Below, proper method of stowing. Note again the even orderly piling of bags—one squarely on top of the other, which facilitates unloading.



c. They have the minimum cubic displacement of any cylindrical container which results in low transportation rates.

The strength of these containers can be increased to meet almost any type of transportation abuse but it is doubtful if any changes need be made in the standard construction of the better types. The all fiber drum is recommended.

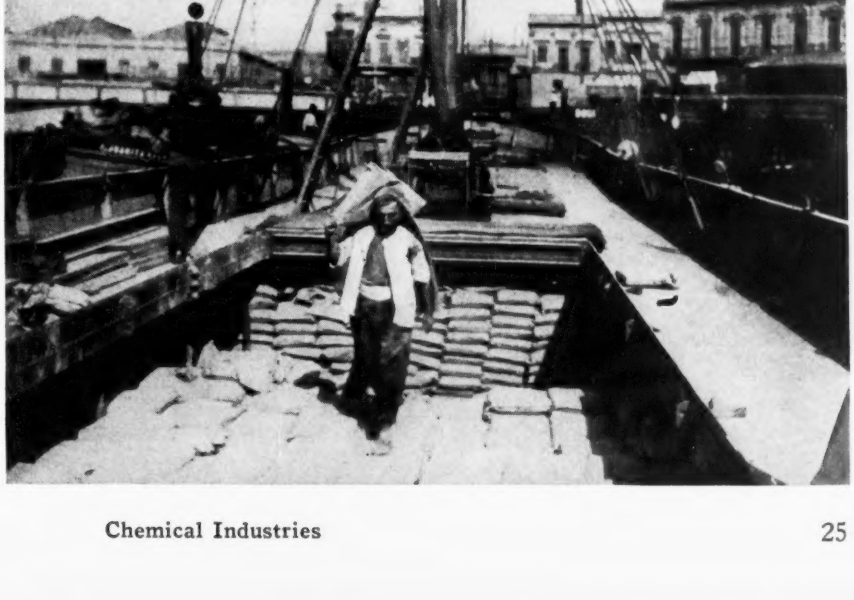
(7) *Wire Bound Boxes.* Chemical shippers in bulk containers have occasional uses for boxes. The wire bound box offers an attractive export container which has the minimum tare weight, can be built with adequate strength, and has a minimum cubic displacement. Manufacturers of these containers are prepared to design boxes for almost any type of unusual service.

The Transportation Division of the Department of Commerce in its packing work aims to improve American packing standards for export and domestic shipping and is in position to furnish shippers with information as to tested packing methods and the practices developed by leading American manufacturers. It is particularly interested in helping shippers to determine for their products the most effective methods of container construction, interior packing, protection against rust and pilferage, and packing for lowest freight and customs charges. The work entails investigation of the latest practices of American exporters in shipping their merchandise overseas and study of the methods employed by experienced European companies in both their domestic and export trade. In the domestic shipping field, the Division cooperates with the various transportation agencies in their efforts to promote better packing practices and reduce transit wastes.

The Transportation Division has prepared a new and comprehensive manual on export packing which it is anticipated will be issued early next year.

It is hoped that the American exporters will use the present opportunity to prove to foreign customers that they can pack and mark merchandise so that it will arrive at its destination undamaged and thus help to permanently secure these new markets.

Proper method of stowing again illustrated in photograph below.



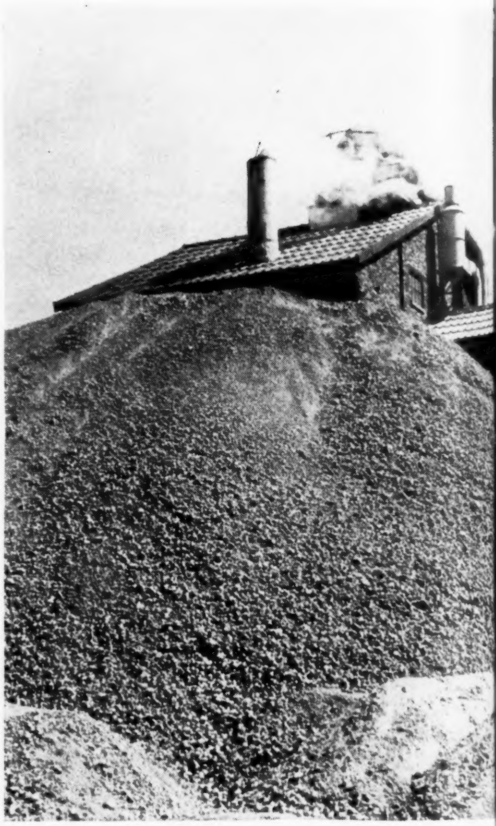
The Chemical Tourist Visits AT THE HUB *of New England Chemical Trade*

By Williams Haynes

YANKEE tinkering is proverbial. But it is a vivid reality. Accordingly, right at the birthplace of our textile, paper, and leather industries, we find close alongside a multitude of plants, great and small, producing all sorts of goods from dynamos to diceboxes. Metals, wood, stone, concrete, plastics wool, silk, cotton, rayon, ivory, glass, jewels—all industrial raw materials are fabricated and processed in every conceivable way by New England industries—a thoroughly up-to-date expression of that good, old habit of tinkering.

Even in chemical making this tinkering habit persists. For alongside the big, heavy chemical operations of several of our larger companies are found in New England scores of chemical specialty manufactures of all sizes producing all sorts of products from mixed fertilizers sold by the ton to household cements merchandized in little collapsible tubes through the dime stores

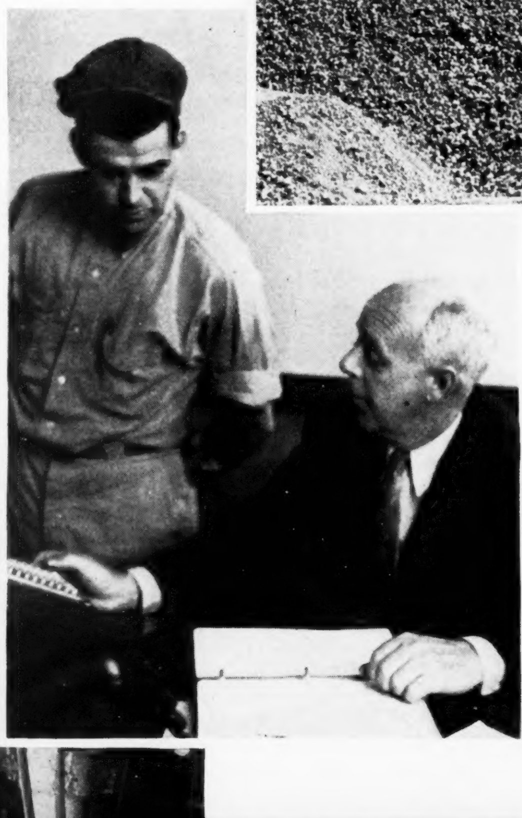
The concentrated and highly diversified industries of this section are the greatest chemical consuming field in the littlest area in America, and New England purchasing agents demand every chemical from alums and the alcohols to the salts of zinc and zirconium.



Great snuff-colored stock pile of bauxite at Monsanto's Merrimac plant on the Mystic River opposite Boston. This raw material of the alumina group of products comes from Central America straight to the company's docks where are also unloaded limestone from Maine and sulfur from Texas.

A Decade of Great Changes

During the past ten years great changes have been forced upon the industries of New England. Rather than having escaped the economic repercussions of the depression and the recession and the new war inflation because of her compactness



David H. Parshley (right) who has charge of the acid and Glauber's salt production at the Merrimac plant, while below is the bagging of alum.

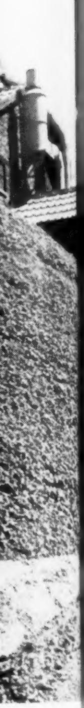
and versatility, New England has suffered abnormally from the impact of changing conditions.

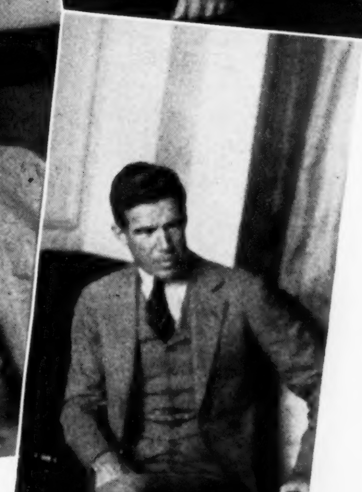
Let us therefore go to Boston, very literally the Hub of New England chemical trade, to observe at first-hand a chemical evolution quite as interesting and maybe even more significant than the widely advertised chemical evolution in the South which we visited four years ago. Because of the multitudinous chemical activities, we must select a few typical companies. If we do this with discrimination, we shall clarify the picture and be better able to judge the causes and forecast the effects of an industrial situation that with certain local modifications represents the entire chemical field.

Largest Plant in New England

On one hundred and nineteen acres of low-lying land, flanked on the West by the Mystic River, on the East by one of Boston's great new highways, with the Boston & Maine and Boston & Albany Railroads cutting it roughly in half, stands the largest chemical plant in New England. The location is historically and commercially important. It was selected in 1872 after three years combing search for the ideal chemical plant site by two exceedingly shrewd chemical manufacturers.

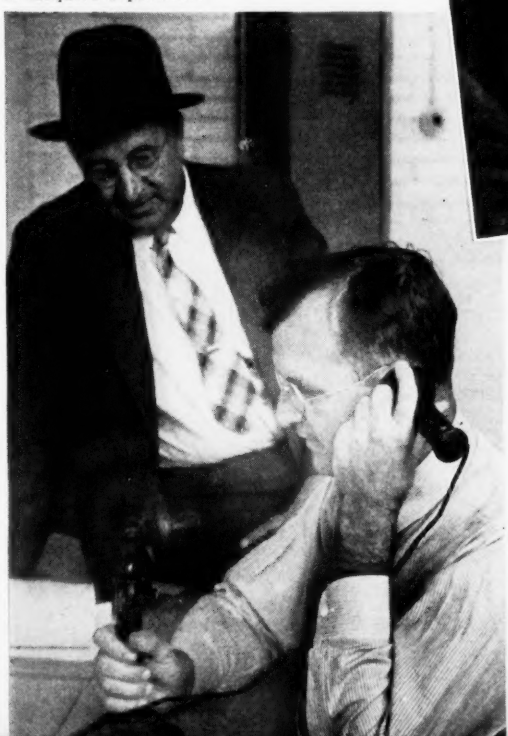
Originally this tract on the outskirts of Everett had been occupied by the old New England Chemical Co. To acquire it Alexander and Hugh Cochrane bought out this competitor. Already their company—founded by their father in 1847—had taken over the Newton Chemical Co. of Waltham and later they bought the Cambridge Chemical Works. Their Cochrane Chemical Works was merged in 1917 with the Merrimac Chemical Co. which traced back to 1853 when Robert Eaton established the Woburn Chemical Works which combined with the Merrimac Chemical Co. in 1863 and subsequently absorbed William H. Swift & Co.





William M. Rand (in circle) from Harvard, to the U. S. Navy in the World War, to banking, to treasurer of the old Merrimac Co., to manager of their sales, to Monsanto vice president in charge of the Merrimac Division thumb nails the career of this widely known, popular chemical leader.

Two men (below) not a little responsible for high honors the Merrimac plant has won for its low accident record — Earl Sevrens, safety engineer, and at the phone Harold Stevenson, superintendent of lacquers department.



R. O. Fernandez, in charge of lacquers sales confers with L. A. Pratt, Merrimac's general manager of sales—two notable examples of technically trained sales executives—in fact Mr. Pratt (who has a Ph.D. in chemistry) began in the plant, became manager of lacquer production and was director of research before taking up sales work.

Horace Burrough, III, (above left) assistant sales manager, comes of a chemically minded family, and with training at Johns Hopkins and the Naval Academy, carries on the technically minded selling traditions of Merrimac.

Everett E. Brainard (above right) went from school to the buying department of Merrimac and has been "PA" since 1898.

Thus when Monsanto took over Merrimac in 1929 the company literally represented the gradual amalgamation of seven different plants, most of them with roots going back into New England before the Civil War; a development that was quite typical of American industry during those years.

From the first all these enterprises had all made sulfuric and muriatic acids, and each had featured some particular line of industrial chemicals. The Cochranes, for example, were famous for ammonia and sulfate of alummia; Merrimac for hydrate alum and aluminum chloride. Combined these seven operations were the largest and most complete heavy chemical company in New England.

Alliance With Monsanto

Alliance with Monsanto has brought basic changes. Although Salmon Wilder, after years of valiant service which included the consummation of the Merrimac-Cochrane consolidation and leadership during the World War, resigned and vice-president Charles Belknap was drafted for executive duty at St. Louis, the management in the hands of William M. Rand has remained of and by New England. But the company has been transformed from a local, almost privately owned enterprise, into a national corporation. Hence the Merrimac Division has branched out both in territory and in products.

Formerly Merrimac sold New England. Its years of stability rested on the policy of intensively cultivating a rich, nearby market. Now the Merrimac heavy chemicals are sold by special salesmen through Monsanto offices spotted throughout the country at strategic points. The broader area has more than taken up the slack created by the migrations of the textile and paper industries. Moreover, the old Merrimac line, which was strictly inorganic, has been supplemented in New England by lacquers, alcohol, solvents, as well as by the phosphates and the fine and medicinal coaltar chemicals of Monsanto. These fields were first tilled by Fred Renner (now assistant branch manager in New York) and these distinctively St. Louis items are now handled by C. F. Trombley and S. U. Shorey.

Add New Units

In the plant two new units—new not only in buildings, but also to the scope of operations—are the phthalic anhydride and alcohol plants. The first is obviously a child of the Monsanto union. The second is jointly owned with important Puerto Rico sugar interests who furnish the molasses raw material. Both are the sole producers in New England of their respective products, and they tie in well with the company's lacquers and plastics activities.

Merrimac Lacquers

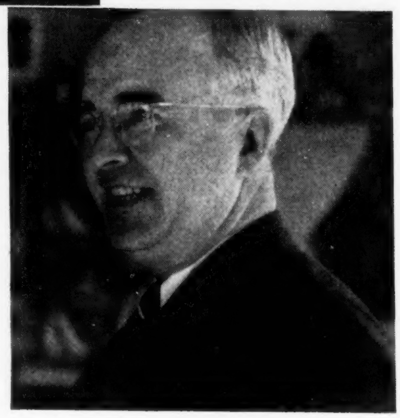
Merrimac's lacquer interests are unusual in that they make no "shelf goods" and little for the motor industry. They specialize in airplane wing coatings and impregnating and coating materials for the leather, paper, rubber, metal and woodworking fields. It is a tailor-made business, particular formulations for special customers, and a growing outlet is in private formula work. You'd be surprised—at least I was—to learn that the Merrimac Division is one of the country's largest makers of manicure enamel, made to order for cosmetic houses and shipped to them in drums for packaging.

Development of Specialties

The trend toward specialties is strong today even among our makers of the most prosaic heavy chemicals, and to Ferrisul, a special grade of ferric sulfate for water and sewage treatment, there have recently been added other Merrimac products merchandized in this modern manner. Ferrisul sales, which are nation-wide, are handled by J. J. McCarthy with a man in Boston and one in Chicago to take care of the far-flung territory that is cultivated.

Santocel is a Merrimac Division product, developed and sold by them, an unusual type silica gel which has recently come to the market and has many uses in insulation, for dispersion in rubber formulation and in printing inks. It is a powder "lighter than feathers" and were cost no object it is the best heat insulation material. Mertanol is a synthetic tanstuff used particularly for the chrome tanning of white and light-colored leathers. The newest comer from the

Frank S. Post and C. W. Ten Broeck, respectively a director and treasurer,director-production manager of Howe & French, both make their headquarters at the Weymouth plant of firm. The active head is Mr. Ten Broeck, an old Du Pont coatings operating executive and an inventive engineer who has developed a special type of lacquer mixing machine very widely used.



Two mainstays of the Howe & French business of producing various cellulose "dope" specialties are Clarence W. Taylor (left) the chief of a chemical research staff that seeks new products and serves special-to-order customers, and John J. McDermott, the superintendent who keeps up uninterrupted production of this many-sided operation.

Few plants in the industry have so picturesque and historic a setting as the Howe & French operation at Weymouth—on the site of one of the first grist mills in New England, the main building overlooks the old mill pond. Twenty acres and as many unit buildings—and a line of ultra-modern tailor-made items fed and supported by laboratory research.

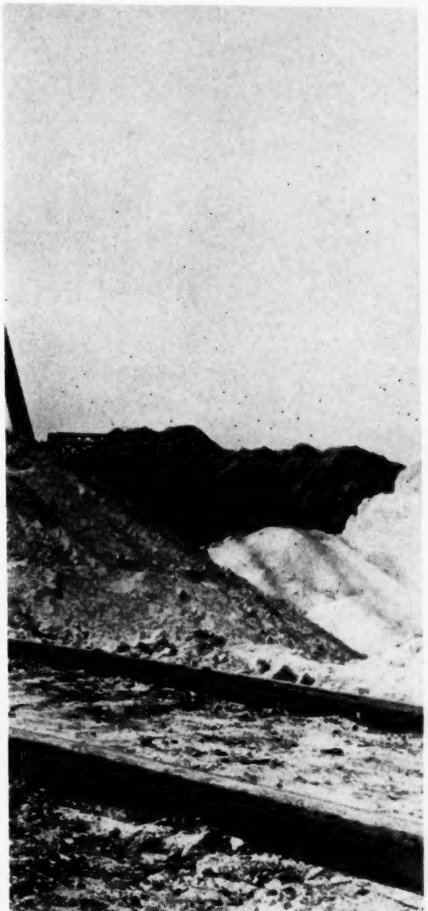
laboratories at Everett is "Sopet," a water soluble spinning agent which has a distinct advantage over oils for many uses.

Specialist In Coatings

From a beginning as early, through a course quite distinct, another Boston chemical firm has come also to the manufacture of coating specialties. Howe & French is an organization that for a hundred and five years has been active in the chemical trade. Starting as a dealer and importer of drugs, oils, paint materials, and chemicals, it has served New England consumers throughout a period that goes back to the day when these supplies came from foreign sources. Like their honored competitors, E. & F. King, Marbel-Nye, and Linder, their business long ago began to concentrate upon industrial chemicals, their principals gradually changing from British, German, Dutch, and French manufacturers to American as the chemical industry in this country developed. And of late years, in addition to jobbing a regular line of chemicals, they have emphasized laboratory reagents and supplies and gone into the making of specialties.

Howe & French History

This change has been a slow evolution. As far back as the seventies, Howe & French began the manufacture of isinglass at a plant in South Weymouth standing on the site of the town's original grist mill. Howe & French began to manufacture nitrocellulose lacquers in 1895 and continued thereafter to greater or lesser extent. At the the close of the World War they began converting surplus nitrocellulose into lacquers. At first a sort of hobby of C. P. Seaverns, the president, who is still the very active head of the organization with which he began his business career as order boy; for several years this lacquer business grew slowly till C. W. Ten Broeck came from the Du Ponts to become plant manager.



The Merrimac Mountains—the big yellow pile of sulfur is a landmark to all good Bostonians—flanked by lime, bauxite, and coal.

Now 27 Buildings

Now twenty-seven buildings stand on the twenty acres and nobody knows definitely just how many products are turned out. This is reasonable, for the Howe and French coatings, like the Merrimac, are a specialized, made-to-order line. Finishes are produced for everything from a rayon filament to a smokestack, many of them made for particular customers, others sold in bulk to packagers who merchandize them under their own label. Here is a business that must be backed by a highly trained, specific research, not only to keep in the forefront of coatings progress, but also to solve the knotty problems of customers in many lines.

(Part II will appear in an early issue.)

"This Age of Synthetics"

MANUFACTURE of nylon yarn in the first unit of the new plant at Seaford, Del., began on December 15. Production of the yarn, scheduled originally for early in 1940, was advanced several weeks, due to the project being completed earlier than was anticipated when the construction work started January 20 last.

Operations will proceed gradually, gaining speed as experience develops with equipment and personnel. A single spinning machine was started December 15 and the product minutely observed and proved satisfactory before other machines are put in operation. Capacity levels probably will not be reached for several months.

The plant is the first of its kind ever built, designed to fit an operation never before undertaken. The original unit is a single building, 1052 feet long and 272 feet wide. Slightly irregular in shape, it is essentially an elongated, single-story rectangle, extending from a six-floor tower at one end. The roof is flat, broken by terrace-like set-backs at different elevations. Large pent-houses accommodate air-conditioning equipment, with cowls and supply ducts coiling across them.

The walls are of red brick, with plentiful window space assuring maximum daylight for the service area. The facade is relieved by concrete trim and the window openings. A temporary wall closes in one of the long sides, preparatory to a future addition.

The plant gives the impression of extreme neatness and order. Concrete roads and walks have been laid throughout the grounds. The interior walls of the plant are faced with buff

Top, aerial view of the new nylon plant of the Du Pont Company just outside Seaford, Delaware. Left, top, nylon yarn being processed. Here machines twist the "bundle" of slender filaments for ease in handling. "Yarn" is composed of numbers of these fibers twisted together into a single thread. Left, brushes made of nylon bristles are a great aid in cleansing bottles, one of the rapidly expanding uses of these new brushes.

tile. The floors are of concrete. To the south of the structure is a large ultra-modern power plant, with a 250 foot stack. It is connected by pipe line to the Nanticoke river several hundred yards distant, where oil storage tanks and a dock have been erected. Facing the plant is a two-story administrative office building.

The manufacturing process begins in the tower, reached by metal stairways. On the top level are huge insulated vessels of stainless steel. Below are other large autoclaves extending through two floors of the building. Pipes, layer upon layer, line ceiling and walls, forming strange geometric patterns as they converge. On a lower level is a long line of shining metal canisters reaching from floor to ceiling. Each floor is devoted to a separate phase of the operation as the material flows downward through the crucibles of chemistry.

Electrical instruments mounted on panels guide the process with minute precision. Robot observers signal with flashing lights and chimes. Temperatures and pressures are recorded in vari-colored lines on paper discs. There are scales that print measures of weight on ticker-tapes similar to those in a stockbroker's office. Each aspect of the performance is carefully and systematically scheduled to the split second.

On the lower levels of the tower, intricate mechanisms designated as spinning units transform the nylon flakes into the slender, web-like filaments of nylon yarn. These units are grouped in batteries of twenty, set in horizontal wells through the floor. From the top, they resemble circular flour sifters, shaped to fit into the apparatus. They are kept filled with the flake-like nylon chips by mobile hoppers, traveling along an overhead rail. Here the material is melted, then pumped under pressure through "spinnerets,"—cups pierced with tiny holes. On the level below, the filaments appear, almost invisible individually as they become solid upon reaching the air. The fibres are again whisked from view down a narrow pipe-like chimney, where on the floor below they are wound on bobbins. The man-made harvest is complete as the strands spin merrily around the cylinder.

From this point, the yarn begins its progression through the various processing operations. The length of the plant is partitioned laterally into a series of long rooms, housing rows of textile machinery. Running at high speeds, these devices rotate spools and bobbins. The batteries of machines stand row on row along long aisles, the regimented ranks of modern industry. Their mission is to twist and otherwise prepare the product for industrial purposes.

After a "pre-twisting" to facilitate handling, the bundle of fibres is drawn or stretched to impart the strength and elasticity peculiar to nylon. This is accomplished by a machine which stretches the yarn between two rotating devices going at different speeds. Chemists characterize this process as a rearrangement of the nylon molecules in an orderly, length-wise array, rather than in helter-skelter fashion like individual straws in a hay stack.

The yarn is then twisted and given a "size" and lubricant in preparation for knitting and weaving. After final inspection it is packaged in skeins, cones or other forms and delivered to the shipping room at the building's extreme end, where a loading platform parallels the railroad tracks.

Longitudinally, the plant is bisected by a corridor separating the manufacturing from the service section. This area provides quarters for store rooms, machine shops, a control laboratory, supervisory offices, locker rooms and a cafeteria.

The air-conditioning plant is one of the most modern indus-

The young woman, above, is using one of the first hand and nail brushes made of "Exton" nylon bristles. It absorbs only one-fifth as much moisture in volume measurement as hog bristle—the best natural bristle available—and absorbs it more slowly. Bristles made of nylon do not split or break. The bristles will outwear any natural bristle. Center, this fishing enthusiast includes in his equipment line and leader made of nylon. Right, the sheerness of women's hosiery manufactured from nylon yarn is demonstrated in this picture.

trial systems of its type ever constructed. The conditioning units are housed in special rooms above the roof. Refrigeration equipment is located in the power plant. The chilled water for the units is piped in underground. Temperature and relative humidity are maintained at a constant throughout the plant.

The plant will produce polymer, as well as yarn. Some of the polymer will be made into brush bristles and surgical sutures, among other articles, by the Du Pont Plastics Department plant at Arlington, N. J.

The plant, when in complete operation, will produce approximately four million pounds of nylon yarn a year. About 850 workers will be employed in operating the plant.

Opening of the plant climaxes a ten-year research program. Nylon fibres for textile uses, such as will be manufactured at Seaford, are wholly man-made and have no counterpart in nature. One of the most promising uses is in hosiery. Other textile applications, such as knit goods, underwear, and woven dress goods are the subjects of experimentation.

The nylon process is begun in the Du Pont plant at Belle, West Virginia, which has been enlarged in the last year. The "intermediates" made at Belle will be shipped to Seaford.

The Seaford plant site is on the outskirts of the town. It comprises several hundred acres. Two miles of railroad spur have been built into the plant from the Pennsylvania tracks nearby. River transportation will be used for fuel, oil being barged up from the Chesapeake Bay. Other shipments will be made by rail or truck.

Fireproofing Wood

By W. G. Cass

MUCH of the recent research in connection with fireproofing agents has been directed towards those for use with textiles, as for example in the recent introduction of ammonium sulfamate by Du Pont, forming a valuable outlet for surplus urea which is fairly easily convertible into sulfamic acid. Doubtless every effort will be made to have these newer agents in form suitable for use in fireproofing timber also, as this would obviously extend the market for such very considerably. Certainly this latter field of use is of the utmost importance when one reflects on the enormous losses in a country like the U.S. due to fire, and where so much timber is still used for constructional purposes. According to Koritnig, writing in a recent issue of the German publication "Arbeitsschutz" this matter of fireproofing should be subject to stricter regulations and to more stringent specifications than in the case at present; also builders and architects and other users of timber are not so conversant either with the need or the methods of fireproofing as they should be, and fuller information and wider publicity on the subject are urgently needed today.

It is necessary in the first place to distinguish carefully between impregnation of the timber on the one hand and coating or painting on the other. There are several fairly effective agents of both types in the market, and it is a question of choosing the one or more most suitable for the particular purpose intended. Both kinds must entirely remove or at least considerably reduce the inflammability of the wood, and should contain emulsifying agents which do not combine with water, do not cause saccharification or caramelization of the woody fibre, assist in restraining decomposition or rotting, do not corrode the iron or other metal in contact with the wood, and must be not only in themselves non-poisonous but under no circumstances produce toxic gases or fumes.

In the paint or coating class one of the oldest and still one of the most effective is waterglass or sodium silicate in some form or other, either alone or in conjunction with other fireproofing agents such as powdered asbestos, alum, calcium chloride, alumina, etc. The silicate forms a firm, closely adherent protective layer which totally excludes air, and what is still more important it remains even more effective in this way under the high temperatures arising during a fire. Materials may also be used which decompose at high temperatures and yield inert noncombustible protective gases, such as carbon dioxide or sulfur trioxide, which prevent ingress of air or oxygen and thus choke the flame or inhibit combustion altogether. In this class may be included also carbon tetrachloride which gives off inhibitive gas by evaporation. It must always be remembered that combustion consists in more or less rapid chemical reaction between the wood and the oxygen of the air, and the basic principle of fireproofing is the prevention of this reaction. Some form of borax or boracic acid, also sodium phosphate have been found useful in coating the surface of the wood at high temperatures with a glassy layer. Calcium carbonate (chalk or limestone) may sometimes be incorporated with sodium silicate in order to improve its suitability for some kinds of wood; and where color is desired it is essential that the pigment should be carefully chosen, as some of these combine with the silicate and form very undesirable compounds from a paint and fireproofing point of view.

Other suitable materials are magnesium sulfate and talc; also mixtures of solutions of ammonium sulfate and borate which yield ammonia on heating which tends to choke the flames while the borate coats the wood with a glaze. The addition of ammonium benzylnaphthalin sulfonate enables the fireproofing agent to penetrate the wood better. Corrosion of iron or other metal in contact with the wood is less liable to corrosion if boric or phosphoric acid is used or their water-soluble salts. Some of the newer fireproofing agents contain sodium wolframate as well as sodium carbonate, also easily soluble ammonium compounds, such as the acetate, bromide, chloride, phosphate. The action of these and other materials on the wood, under the conditions likely to prevail or arise, must be carefully borne in mind, especially the extent of charring or saccharification of the fibre, and other effects.

Valuable research on the fireproofing of timber is being continued at the Forest Products Research laboratory at Princes Risborough, England, by N. A. Richardson and co-workers.

The patent literature of fireproofing wood is of course very extensive, but many of the patented methods or materials are only slight modifications of those already known. For example, in a fireproofing paint claimed in Eng. pat. 489,464, the principal ingredient is sodium silicate—one of the first materials to be used years ago—together with lithopone and asbestos and possibly small additions of micaceous iron ore or ochre. Another preparation recently patented (Eng. pat. 495,760) contains ammonium sulfate, ammonium acid phosphate, boric acid, colemanite, sodium fluoride and one of two other items, all of which are known.

A much more ambitious and certainly more novel idea is that contained in the Eng. pat. 500,223 of du Pont de Nemours, who claim the use of various complex organic compounds—monomeric compounds of the acrylic series—together with a catalyst for effecting polymerization. It is said that treatment wtih these materials not only affords fireproofness, but also waterproofness and resistance to insect attacks, to shrinkage, warpage, and swelling; at the same time increasing strength and electrical resistance.

17th EXPOSITION OF CHEMICAL INDUSTRIES

Visitors at CHEMICAL INDUSTRIES booth examining the 403 "New Chemicals for Industry" — the new products developed in last two years by its advertisers

Above, left, J. P. Remensnyder, Heyden Chemical; right, B. B. Countryman, Minnesota Mining & Manufacturing.

Left, Coleman Caryl, Stamford Laboratories of Cyanamid.

Left, Dr. B. D. Saklatwalla, Alloys Development, Pittsburgh.

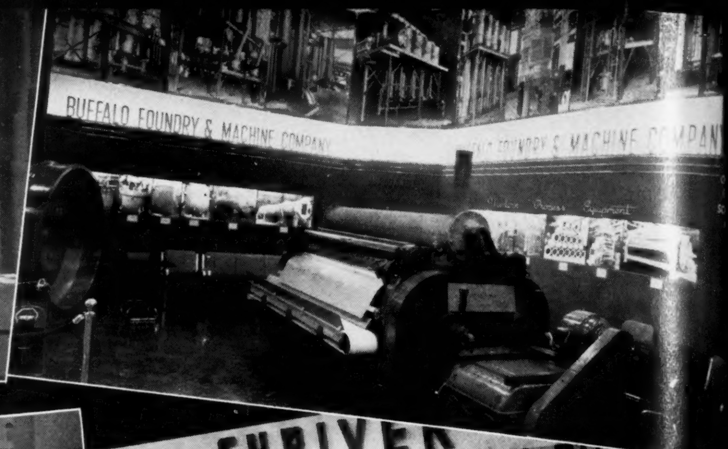
Above, Dr. E. R. Weidlein, Director of Mellon Institute; left, A. D. Camp, The Dorr Co.

Above, Bruce Silver, N. J. Zinc Co.

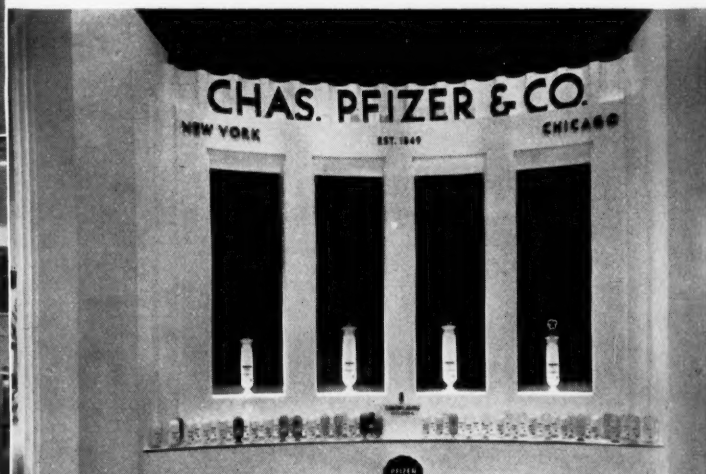
Left to right, John Swenehart, advertising manager, Atlas Powder; James Frorer, chemical division of Atlas; W. Hull, Cyanamid research chemist; and Dr. F. C. Schubart of the Patent and Abstract Division of the same company.

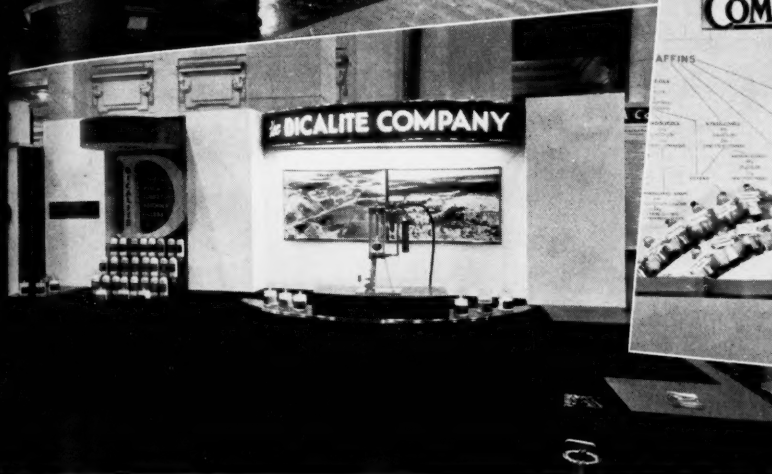
Harold Fyffe, Oldbury Electrochemical; J. R. Schmertz, Mathieson Alkali; Walter Savell of the same company.

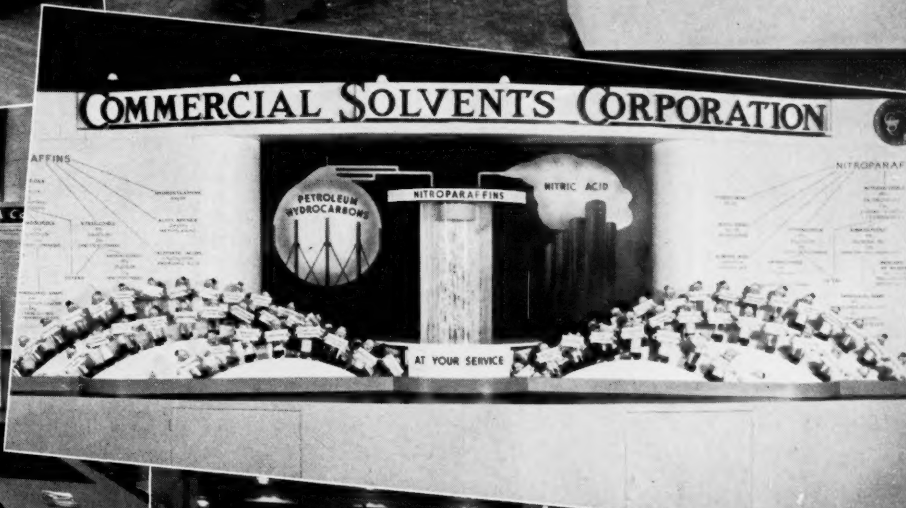
Left to right, Rivers Fortier, Darco, New Orleans and West Indies Sugar Expert; L. M. Gill, General Manager, Darco, New York City; William C. Lytle, Vice-President, Atlas Powder, in charge of Darco Corp.



THE 17th Exposition of Chemical Industries, held at the Grand Central Palace the week of December 4-9, drew over 40,000 visitors who universally acclaimed the attractiveness







of the booths. Exhibitors were delighted at the type and number of inquiries developed. Many expressed the opinion that the show was the most successful one in a decade.

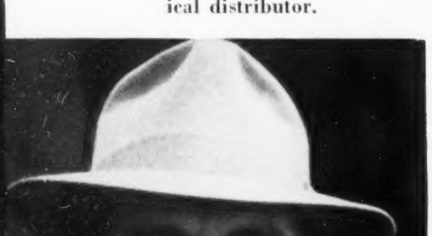
Exhibitors and Visitors

J. M. W. Chamberlain, Manager, Engineering Division, U. S. Stoneware.

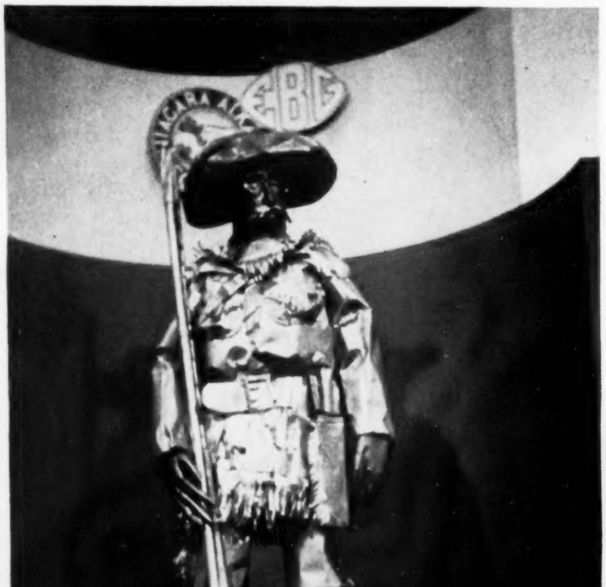
Above, left, Dr. A. E. Boss, Manager of Columbia Alkali's technical service department, discusses a new product shown at CHEMICAL INDUSTRIES' booth with J. E. Weaver of Pittsburgh Plate Glass, traffic department.

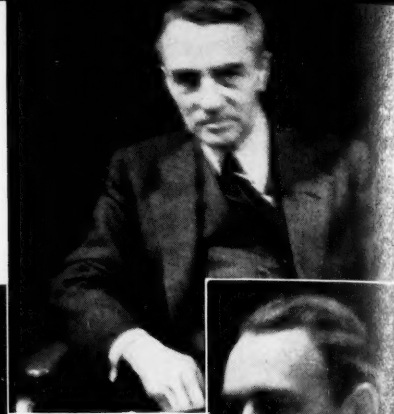
Clarence W. Marsh, Consulting Engineer.

Frank D. McAllister, Charles A. Dean, Inc., Detroit chemical distributor.



Most faithful in attendance at the show was "The Pioneer" at the Electro Bleaching Gas booth.





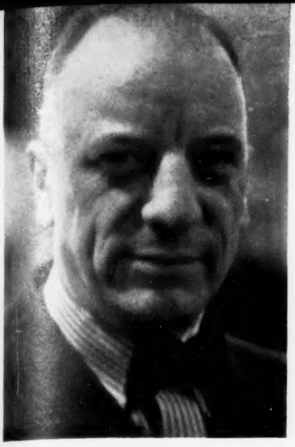
Above, O. W. Oppenheimer, President, Pittsburgh Steel Drum: right, R. E. Williams, B. F. Gump Co.

Above, S. A. Alsop, President, Alsop Engineering.

Right, T. J. Thompson, Corning Glass.

Howard Farkas, Sales Manager, U. S. Stoneware.

at the Chemical Show



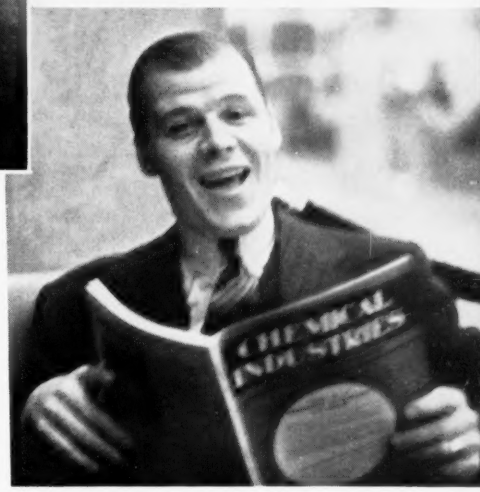
P. C. Kingsbury, Chief Engineer, General Ceramics Co.

Above, Charles S. Wehrly, Merchants Chemical.

George Ryder, President, Chemicolloid Laboratories.

Left, Norman A. Evans, Sales Manager, Pressed Steel Tank.

A. B. Merriam, Bemis Bro. Bag.



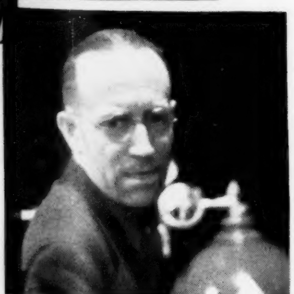
Above, John McKean, plant superintendent, Charles Pfizer & Co.; left, Foster D. Snell, chemical consultant.

Left, Campbell Rutledge, Jr., Corning Glass.

Right, Thomas Evans, Sales Manager, chemical equipment division, Baker-Perkins, Inc.

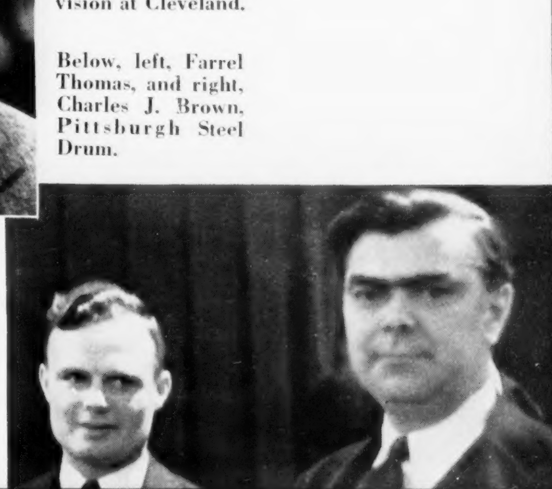
Conrad Penucci, New England Tank & Tower.

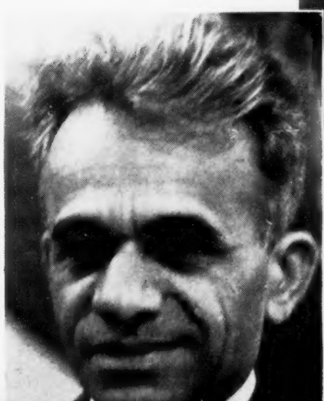
Left, E. C. Young, chemist with Du Pont's Grasselli Division at Cleveland.



William J. Dugan, The Matheson Co.

Below, left, Farrel Thomas, and right, Charles J. Brown, Pittsburgh Steel Drum.





Left, M. R. Bhagwat, Secretary, Chemist Advisory Council.

Chemical Chronology, 1939

January

The Council of Industrial Alcohol Users formed with Ernest T. Trigg as chairman—Chemical Alliance transfers headquarters to Washington; elects as president, Charles Belknap, Monsanto, and three new directors, C. S. Munson, U. S. I., H. M. Hooker, Hooker Electrochemical, and Major T. P. Walker, Commercial Solvents—Rep. Walter M. Pierce (Ore.) introduces bill to provide government manufacture and distribution of chlorates for weed control—H. L. Derby, Cyanamid, speaks for chemical industry at "The Industry Forum—1939"—Business leaders optimistic over '39 outlook—Dr. Walter S. Landis reelected president, Chemistry Advisory Council—P. F. Lavadan, Liquid Carbonic, heads compressed gas makers—A. S. T. M. forms sub-committee to report on standard tests for textile finishes—Industrial chemical consumption rises slowly from year-end lull—Sales executives disappointed at volume—Industrial Alcohol Institute elects Glenn Haskell of U. S. I. as president—New classification for specially denatured alcohol, in which the authorized uses are grouped under less than 20 general headings as compared with over 400 specific, individual uses, is announced—James H. Critchett and Francis B. Morgan elected vice-presidents of Electro Metallurgical, a unit of Carbide—Rollin C. Gere forms new concern to take over old Coopers' Creek Chemical—Monsanto to construct $250,000 phosphoric acid conversion unit at Monsanto, Ill.—Julian Y. Williams and George H. Fick now A. A. C. vice-presidents—Special congressional committee investigating phosphates recommends expansion of T. V. A. facilities at Muscle Shoals and experimental work in the Western phosphate areas—Joseph Wafer, Industrial Chemical Sales Division, West Virginia Pulp & Paper, installed as president of the Salesmen's Association—Declines outnumber advances in leading fats and oils with chinawood definitely lower—Commercial Solvents sells balance of holdings in Commercial Solvents (Great Britain), Ltd.—A. I. Ch. E. elects Webster N. Jones to succeed the late Frederick C. Zeisberg as president—Deaths: Charles E. Kelly, 42, senior partner, Hagerty Bros., and former Salesmen's Association president; William N. Barnum, 50, treasurer, R. W. Greeff & Co.; William Longfelder, 66, vice-president, H. Kohnstamm & Co.; Herman B. Van Cleve, 78, vice-president, Interstate Chemical Manufacturing; Roland T. Will, 53, founder, Will Corp., Rochester.

February

Supreme Court administers severe verbal "spanking" to N. L. R. B. in Fansteel Metallurgical case—Senate sub-committee suggests 4-year buying plan to acquire $100,000,000 worth of strategic and critical raw materials—President Roosevelt in message to Congress asks legislation to conserve coal, oil and gas supplies—Mercury "skyrockets" to $90 when heavy buying takes up most of the domestic output—Davison Chemical inaugurates income security plan for employees—Henry Reichhold, president, Reichhold Chemicals, Inc., elected president of Fred L. Lavanburg, Brooklyn dry color manufacturer—National organization of farm and factory producers of fats and oils formed with J. F. Johnson, St. Louis, as president—Hand-to-mouth buying of natural raw materials—Houdry Process Corp. sells license to Standard of California—Golden Gate Exposition opens at San Francisco—Mining and metallurgical engineers at annual meeting in N. Y. City bestow Robert W. Hunt Award jointly on Kenneth C. McCutcheon and John Chipman—Lothair S. Kohnstamm becomes president of H. Kohnstamm & Co.; Edward H. Kohnstamm elected board chairman—"Should Salesmen Be Chemically Trained," Ernest R. Bridgwater, Du Pont, speaking before N. Y. Chapter, A. I. C., initiates industry-wide discussion on subject—Deaths: George W. Goudy, 69, director of Philadelphia Quartz; Frederick J. Kenney, 60, well-known chemical consultant; Elam Cross Curtis, 45, assistant superintendent of Mathieson's Niagara Falls plant; Dr. Charles A. Ernst, 67, a founder of American Viscose; Louis D. Etman, 60, Gilman Brothers, Boston.

March

Joint congressional committee investigating T. V. A. supplies a virtual "clean bill of health" for the Authority—U. S. applies 25% countervailing duties against Reich goods and cancels Czech trade pact—A. C. S. organizes student affiliate chapters at 16 colleges—Charles A. Higgins elected Hercules' president—Proposed tax increase on imported oils killed—Franklin Institute honors Carbide, Du Pont, Monsanto, Libby-Owens-Ford, and Pittsburgh Plate Glass for the manufacture of polyvinyl acetatal lamination, a better, more safe glass—President Roosevelt opposes as economy measure expenditure of large sums for purchase of strategic materials—S. W. Jacobs again heads Chlorine Institute—W. S. Carpenter, Jr., chairman of Du Pont's finance committee, tells stockholders that company's business is 25% ahead of corresponding January-February period of '38—Schoellkopf Medalist for '39 is Charles F. Vaughn of Mathieson Alkali—Carl B. Fritsche, formerly active director of the affairs of the Farm Chemurgic Council, appointed manager of Reichhold's plastics division—Henry E. Perry elected a member of Commercial Solvents' board of directors—Chemical shipments disappoint manufacturers—Texas legislature once again considers raising sulfur tax—T. N. E. C. probes sulfur industry—Isco takes space at N. Y. World's Fair to demonstrate Larvacide—Alcohol prices slashed for second quarter—Keen competition develops in butyl acetate and butyl alcohol—Cold weather delays mixed fertilizer sales—W. T. Wright, National Fertilizer Association president, scores Department of Justice investigation of fertilizer industry—American Council of Commercial Laboratories formed—Howard R. Houston, Cyanamid, P. D. Patterson, Freeport Sulphur, and Dr. J. W. Turrentine speak at the National Farm Chemurgic meeting at Jackson, Miss.—Expected seasonal spring rise in business activity disappointing—United Gas Improvement to expand into chemical field—American Coordinating Committee on Corrosion formed—Commercial Solvents to erect Peoria plant to produce Vitamin G—George D. Welles, Jr., appointed Dow advertising manager—Mathieson's Dolomite IV discharges her first cargo of liquid caustic from Lake Charles plant at Norfolk, Va., waterfront storage—Alrose Chemical, chemical specialties, opens new laboratories at Cranston, R. I.—Drug & Chemical Section, N. Y. Board of Trade dinner attracts record crowd—Dr. Joel H. Hildebrand, University of California, awarded William H. Nichols Medal, N. Y. A. C. S. Section—Fred M. Carter retires from National Lead presidency—Deaths: Dr. Arthur Edward Hill, 58, N. Y. U.; John Jay Watson, 64, president, International Agricultural Chemical; Aubrey Bartlett, 62, well-known New Orleans chemical jobber.

April

Chilean Nitrate Sales and the Barrett Company charged with restraint of trade by F. T. C.—Both companies issue statements denying allegations—Turner-Pfister Chemical formed with Walter D. Merrill as president—F. Miller Fargo, Jr., succeeds Robert C. Jeffcott as president of Calco—Martin G. Geiger elected a director of Westvaco Chlorine—First quarter chemical shipments 15% ahead of corresponding period of '38—Hercules plant expansion program—Barrett plans synthetic phenol unit—

Queeny Educational Foundation formed—International Wood Naval Stores Export Association announced—Merck increases wages and rates of pay for many employees in new labor pact—Monsanto acquires Resinox—Carbide plans 10 million dollar building program—Slight improvement in chemical shipments—Paint sales show gains over '38 totals—Du Pont reports $19,075,-376 earned in first quarter compared with $9,060,602 in corresponding '38 period—Du Pont officials, headed by President Lammot Du Pont, dedicate company's N. Y. World Fair Building—Dewey & Almy Chemical enters food wrapping field with "Cryo-Vac"—"Ethofoil," a new film for electrical insulation, is announced by Dow—Monsanto markets "Santophen 20" for preserving wood—Barrett offers revolutionary new group of chemicals-hydrogenated coal-tar solvents—Licensing of chemists one of the principal topics of conversation at Baltimore A. C. S. meeting—Dr. E. C. Williams of Shell Development reports to nation's chemists new process for manufacture of synthetic glycerine—Cheap production of high explosives from air, steam and natural gas forecast by Prof. Henry B. Hass of Purdue—Commercial Solvents announces new lacquer formulation technique—Dr. Walter S. Landis discusses "Women Chemists in the Chemical Industries" at conference of women's college teachers held at Connecticut College at New London—American Turpentine Farmers Association authorizes $200,000 advertising drive—Deaths: Carl Pickhardt, 87, prominent in the chemical field for over 50 years; Adele Morgan Corbet, an associate editor of Chemical Industries; Dr. Jacob G. Lipman, 64, dean of the New Jersey State Agricultural College; Amos. L. Beaty, 69, widely known oil man.

May

Chemical engineers at Akron meeting celebrate centenary of Goodyear's almost accidental discovery of a process for vulcanization of rubber—Shipments of chemicals again disappointing to producers—Merck & Co. plays host to 4,000 on "employees' day"—Newly formed Industrial Research Institute takes members on tour of several outstanding laboratories of the country—Standard of California and Standard of New Jersey buy the Luther holdings of California Spray-Chemical—Du Pont announces plans to build ethylene glycol plant at Belle, W. Va.—Paint oils in good demand with strong advance reported in chinawood—Contract awarded for construction of Eastern Regional Laboratory of the Department of Agriculture at Wyndmoor, Pa.—Keen competition between domestic and foreign cresylic—Wet weather retards paint sales in most sections of the country—Du Pont exhibit at N. Y. World's Fair attracts huge crowds—Du Pont's R. & H. announces new continuous bleaching process for textile employing peroxide as the basic reagent—Mid-American Chemurgic Conference of Agriculture, Industry and Science held at Columbus, Ohio—A. I. C., holding annual meeting at World's Fair, comes out in favor of licensing of chemists—Cyanamid's new Mobile, Ala., plant goes into operation—American Viscose erects plant to produce sodium sulfate from waste acid—Dr. A. A. Somerville, vice-president, R. T. Vanderbilt, celebrates two decades of company service—Dr. F. M. Becket, research consultant for Carbide, is new president of the Chemists' Club (N. Y.)—Deaths: A. E. Wells, 55, a Cyanamid director.

June

Manufacturing Chemists' Association elects Lammot du Pont as president at successful Skytop meeting—G. M.'s Kettering discusses at meeting long-range research project planning and gives insight into work being done on "radiation chemistry," man's imitating of nature's building up of plant life—Rumford Chemical celebrates 80 years of baking powder manufacture with special party at Providence including the "return" of Count Rumford—Peter C. Reilly, president, Reilly Tar & Chemical, receives honorary degree of Doctor of Laws from Notre Dame—Paul Mahler made general manager of Stroock & Wittenberg—Alan Valentine, 38-year-old president of University of Rochester, made director of Freeport Sulphur—Diamond Alkali adds ferric chloride to its list of industrial chemicals—June chemical shipments show contraseasonal gain—Joseph A. Huisking joins Fritzsche Bros.—Wood Ridge Manufacturing (mercury and mercurials) made a division of F. W. Berk & Co.—Hugh S. Williamson succeeds Walter C. Teagle on American I. G. board—John S. Henry made sales manager of Joseph Turner & Co.—Keen competition in C. D. alcohol in N. Y. Metropolitan area results in a 2c price decline in carlot drum quotation—Carbide to spend $1,500,000 for additions to South Charleston works—Several importers withdraw from chinawood oil market—Little oil getting past Japan barriers—Phenol prices turn lower as increased productive capacity forces lower quotations—Reichhold Chemicals, Detroit, plans additional phthalic anhydride unit—7th Circuit Court reverses decision of District Court in important Agicide Case, holding that Agicide Laboratories had not infringed any basic claim of the Dennis patent on the use of cubé root as an insecticide—Marshall L. Havey elected a vice-president of New Jersey Zinc—Titanium dioxide reduced 1c, effective July 1—Lithopone prices are off ⅜c—National Association of Insecticide & Disinfectant Manufacturers at June meeting in N. Y. City discuss "pros and cons" of labeling and marketing problems—Daniel B. Curll, Jr., formerly with Philadelphia Quartz, appointed assistant to A. E. Marshall, president, Rumford Chemical—Walter F. Perkins elected to board of Koppers Company—Arthur Langmeier named to direct Hercules' naval stores activities—Frances M. Suarez, manager of Philadelphia Quartz advertising department, honored by the 35th Convention of Advertising Federation of America for outstanding work—Deaths: Dr. Bernard Herstein, 73, U. S. I. consultant; Guy Pinner, 51, Cyanamid's chief engineer; Eugene J. Droesch, 53, Cyanamid; William F. Hoffman, 72, organizer of American Oil & Supply.

July

Temporary National Economic Committee of Congress in preliminary report suggests far-reaching recommendations for the revision of the patent and anti-trust laws—U. S. announces commercial treaty with Japan will be cancelled on Jan. 1—Contraseasonal gain in chemical shipments—Dr. Emil Ott appointed director of Hercules' research—Further price declines in important solvents—W. W. Angus, Inc., formed to act as exclusive sales distributor for Kessler Chemical—Competition drives phenol down 1½c—Joseph M. Lang, Phosphate Mining vice-president, retires—National Adhesives buys Piel Bros. Starch Co.—Mathieson Alkali erects plant at Lake Charles to make "synthetic" salt cake—General Chemical plans $500,000 addition at Buffalo—First bulk shipment by sea of carbon black made by Godfrey L. Cabot—Leslie S. Gillette resigns as U. S. I. advertising manager to accept vice-presidency of Hazard Advertising Agency—T. J. Knapp appointed assistant sales manager of Freeport—Deaths: Alexander McLaughlin, 77, board chairman, McLaughlin, Gormley, King; Samuel Stroock, 41, vice-president, Stroock & Wittenberg; Thomas M. Rianhard, 75, former Barrett president; Thomas LeClear, 63, chief chemist, Celanese Corp. of America.

August

First Western Chemical Congress held—First half year chemical exports up 7%—D. T. McIver appointed assistant to the president of Freeport—War scare sends natural raw material prices higher—Heavy shipments in chemical field as buyers hasten to increase inventories—Carbide acquires Bakelite—Acetone sales near all-time high as new uses increase demand—F. Dean Hildebrandt in charge of Prior's Chicago office—Kenneth H. Rockey is new board chairman of Chilean Nitrate Sales, and J. Albert Woods is new president—Casein prices "skyrocket"—Columbia

Alkali returns general sales offices from Barberton to N. Y. City—Thomas H. Chilton, director of Du Pont's technical division of the engineering department, awarded Chandler Medal by Columbia—Louis Ware succeeds late J. J. Watson as president of International Agricultural—Federal Food & Drug Administration offers dye makers several color modifications—Congress appropriates $10,000,000 for purchase of strategic and critical materials.

LIBRA

September

Commodities soar on declaration of war in Europe — Leading chemical companies issue statements assuring trade that prices will not be advanced only where absolutely necessary—Manufacturers provide adequate supplies for domestic customers—Huge export demand develops—Du Pont plans 25% increase in nylon plant capacity—H. B. Du Pont elected a Du Pont vice-president—New coal-tar color regulations in force—Ernest V. Finch placed in charge of Michigan Alkali's sales—New Dow plant making "Ethofoil" in full production—Industrial Alcohol Institute to be dissolved—Dr. Robert E. Wilson, Pan American Petroleum & Transport, is Chemical Industry Medalist—Spectacular rise in mercury—"Doc" Knauss resigns from Nuodex to join Reichhold Chemicals—Harold M. Johnson elected a vice-president of Nuodex—Reichhold Chemicals changes Fred L. Lavanburg Co. to a division of Reichhold—Stroock & Wittenberg to construct new alkyd resin plant in South and enlarges Newark plant—Victor to build two additional furnaces at Mt. Pleasant plant—Diamond Alkali buys steamer, *Frank H. Goodyear* and rechristens it *The Diamond Alkali*—Hooker dedicates new general offices at Niagara Falls—Monsanto introduces "Santomask" a new industrial deodorant—A. C. S. Boston meeting attracts 4,000—S. D. Douglas, Carbide, discusses "Vinyon"—Std. of California chemists report on process to produce phenolic compounds from petroleum fractions—Merck plans $300,000 plant expansion at Rahway—Deaths: Andrew A. Holmes, 59, U. S. Potash vice-president; Edwin C. Merritt, 78, retired vice-president of Solvay; Edwin H. Watson, 56, managing director, American-British Chemical Supplies; James B. D. Edge, 65, a Du Pont vice-president; Canfield Jordan, 57, president, W. H. & F. Jordan, Philadelphia.

SCORPIO

October

International Agricultural to spend two and one-half million in potash project—Name of American I. G. changed to General Aniline & Film—Reports from abroad hint at abolishment of Nitrogen Cartel—Drug, Chemical & Allied Trades Section, N. Y. Board of Trade, holds successful fall convention at Skytop—Calco Chemical made a division of American Cyanamid—Alkali, chlorine prices unchanged for '40—Also bichromates—Heavy shipment of chemicals to consumers continues—Foreign chemical users turn to U. S. for supplies—Monsanto's Plastics Division honored by the Associated Industries of Massachusetts for developing two new types of plastics in '39—National Pest Control Association holds highly successful meeting at N. Y. City—John T. Ames elected vice-president, American-British Supplies—DeWitt Thompson nominated for presidency, Salesmen's Association—Walter B. Howe, former sales manager of N. V. Potash, heads newly formed French Potash Co.—Chinawood oil prices soar as stocks reach new low point—Great difficulty in getting material out of China and domestic crop is hit by frost—Reichhold completes plant in Australia bringing total number of plants to seven—T. S. Grasselli retires from Du Pont executive committee but continues as a vice-president and director—Dr. Charles M. A. Stine, Du Pont vice-president in charge of research, announced as Perkin Medalist for '40—Dr. John M. Nelson, Columbia, announced as the William H. Nichols Medalist—Lewis H. Brown, president, Johns-Manville, named as first Vermilye Medalist by Franklin Institute—Deaths: Reginald F. Richard, 55, general manager of Monsanto's Phosphate Division; Edward S. Davis, 66, secretary, Detroit Chemical Works; Charles W. Priddy, 75, former member of A. A. C. board of directors.

SAGITTARIUS

November

Chemical Industries issues special Silver Jubilee issue celebrating 25th Anniversary of the first Exposition of Chemical Industries—American Institute of Chemical Engineers reelect Dean Webster N. Jones as president at Providence meeting—Penn. Salt announces purchase of larger site in Philadelphia for new plant—Buyers rush to cover '40 requirements—Sellers' market for first time in ten years—Dr. C. Lalor Burdick appointed assistant to President Lammot du Pont—Dr. Lewis H. Marks announces resignation from Continental Distilling—Penn. Salt acquires Sterling Products—Supreme Court refuses to review decision of lower court holding invalid the Dennis cubé patent—Spot stocks of many solvents scarce—Superphosphate prices advanced—Exporters find it difficult to obtain chemicals for abroad—Domestic potash producers withdraw from export markets to better serve country's requirements—Critical situation in stocks of Carnauba develops—Naval stores prices fail to register much rise despite sharp advances in other natural commodities—Ernest T. Trigg reelected president, National Paint, Varnish & Lacquer Association—Du Pont announces plans to expand titanium pigments plant at Edge Moor—Dr. Vladimir N. Ipatieff, Universal Oil Products, announced as the Willard Gibbs Medalist by the Chicago Section of the A. C. S.—Deaths: Edward G. Kohnstamm, 82, chairman of the board, H. Kohnstamm & Co.; Dr. Earle K. Strachan, 53, Brown University.

CAPRICORN

December

Chemical Industries publishes special issue celebrating 25th Anniversary of the founding of the paper—Over 400 "New Chemicals for Industry" shown at the magazine's booth at the Exposition of Chemical Industries—Insecticide and Disinfectant makers discuss raw materials supply at 25th Anniversary meeting held in Washington—August Merz reelected president S. O. C. M. A.—Congress of American Industry, sponsored by National Association of Manufacturers, condemns pump-priming as a futile economic policy and demands curtailment of governmental expenditures—"Doc" Dorland, Dow, elected chairman of Drug, Chemical and Allied Trades Section, N. Y. Board of Trade—Du Pont's nylon plant at Seaford, Del., goes into production—Dr. William L. Evans, head of Ohio State's Department of Chemistry, elected A. C. S. head for '41—Sixth Annual Chemical Engineering Symposium of the A. C. S. held Dec. 28-29 at University of Michigan—Commodity Credit Corp., announces that basic loan value for '40 gum naval stores would be substantially the same as that for '39—George W. Merck entertains veteran employees at dinner—Slight let-down at year-end in chemical shipments—Chemical companies generally enjoy best year in decade—Another sensational advance in quicksilver—S. W. Jacobs, Electro Bleaching Gas, honored at dinner by Chemists' Club (N. Y.) for his work on House Committee—Francis P. Garvan, Jr., elected president Chemical Foundation—William Callan elected a vice-president, The Borden Co.—Cyanamid & Chemical opens new plant at Kalamazoo—Commercial Solvents introduces new line of organic chemicals at exposition, the nitroparaffins—Chemical industry piles up an increase of 53% in its net profit for the nine months ending Sept. 30, compared with the like period of '38, a survey of company earnings statements indicate—Deaths: George O. Carpenter, 87, former National Lead vice-president; Hugh K. Moore, 67, former chief chemical engineer, the Brown Company; Simon M. Goldsmith, 70, well-known N. Y. City fertilizer broker.

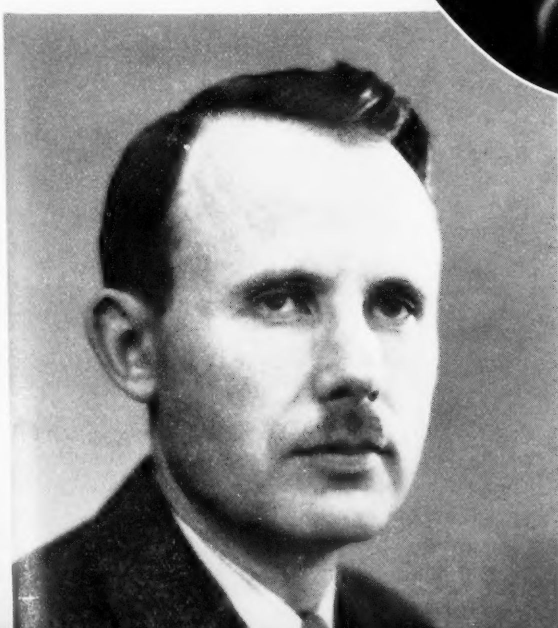
"Headliners" In the News

Ralph ("Doc") E. Dorland, Dow Chemical, recently elected chairman, Drug, Chemical & Allied Trades Section, N. Y. Board of Trade.

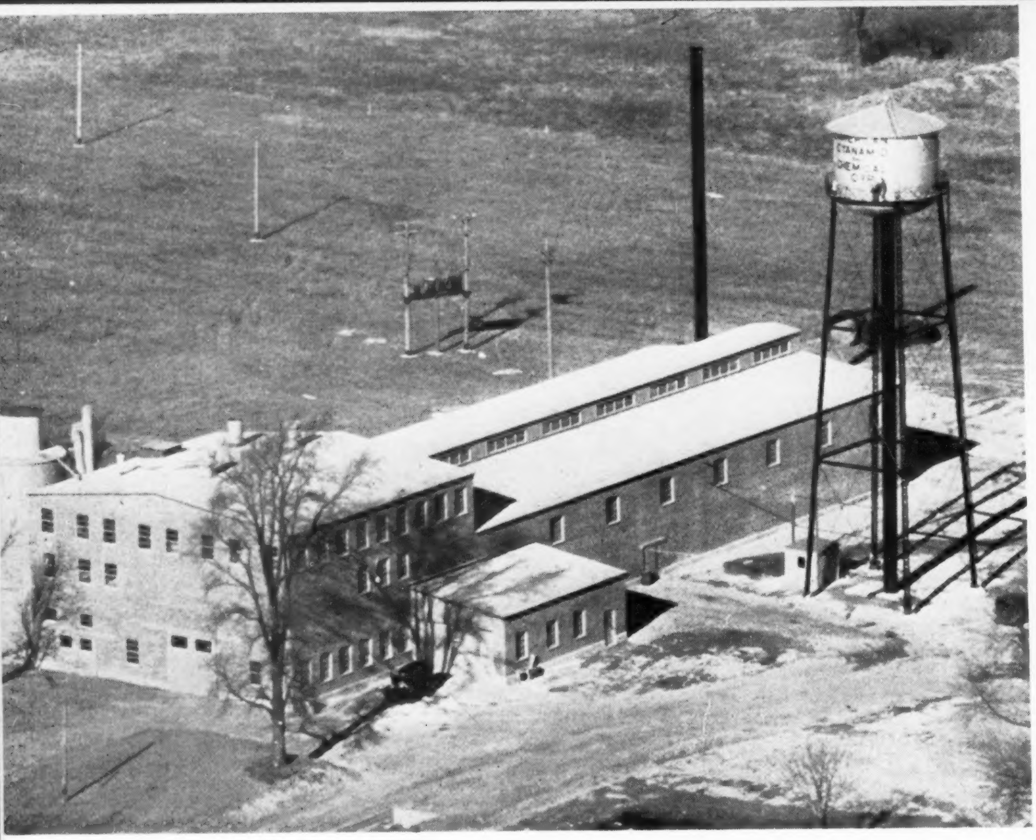
The Board of Directors of The Borden Company, meeting November 28 in New York, elected William Callan (above) vice-president in charge of casein, adhesives and prescription products divisions.

Francis P. Garvan, Jr., has been elected president of the Chemical Foundation, an office held many years by his father, Francis P. Garvan, Sr., who died November 7, 1937. The Foundation has been without a president since his death.

Below, R. L. Forney, assistant to the managing director of the National Safety Council, appointed director of the Council's Industrial Division, effective January 1, 1940. He replaces W. Dean Keefer, who ended 21 years with the council to join Lumbermens Mutual Casualty as assistant to the vice-president in charge of safety engineering, with offices in Chicago.

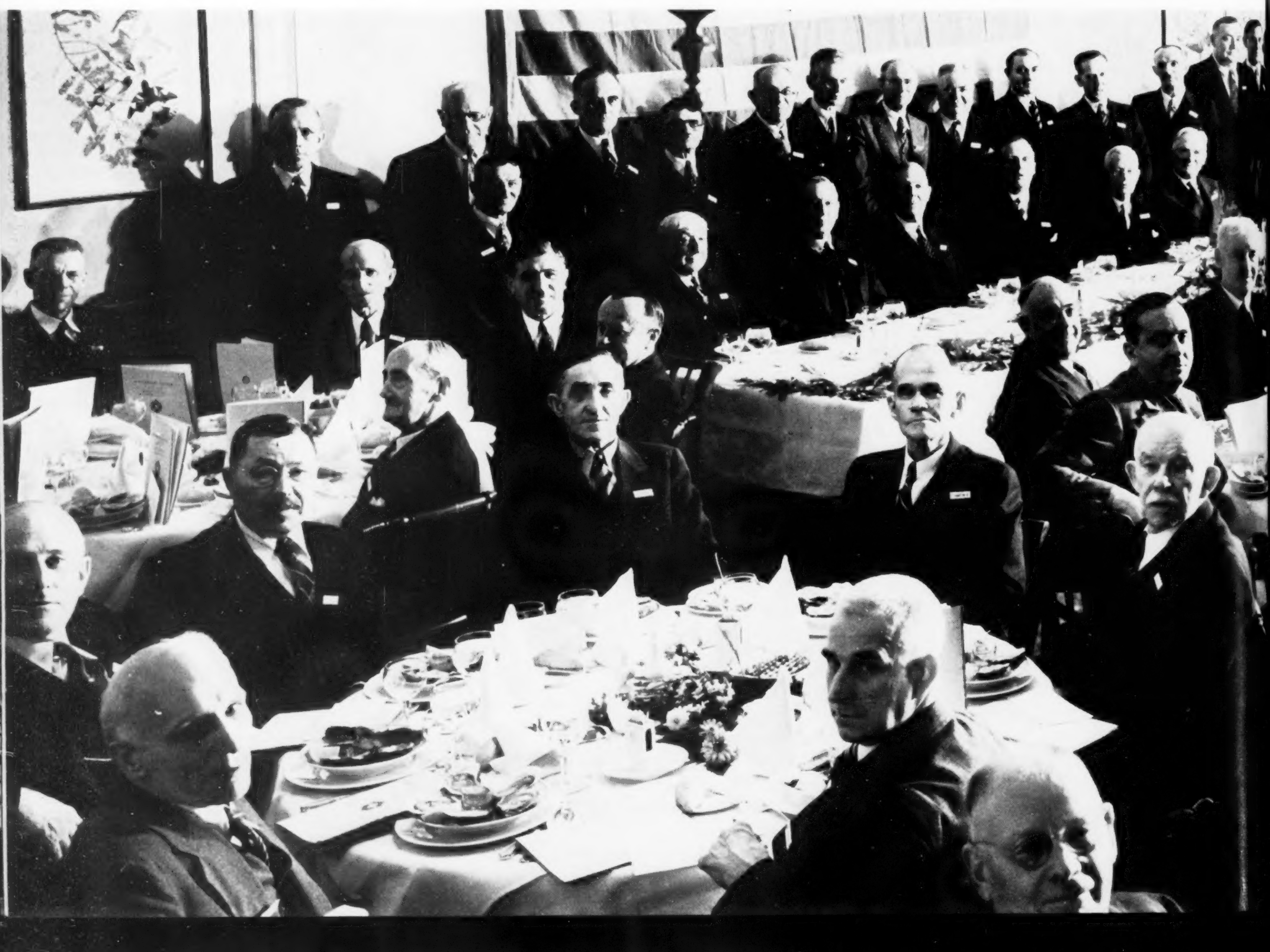


The promotion of two executives, C. E. McKinney (left) and C. J. Minnig, to the offices of vice-president in charge of operations and vice-president in charge of sales, respectively, is announced by Continental Carbon, New York.



On Monday, December eighteenth, in Kalamazoo, Michigan, the newest plant of American Cyanamid & Chemical was officially opened. In addition to the local staff, Harry L. Derby, President of the Corporation, as well as John F. Fredriksson, Vice-President, and Arthur J. Campbell, General Sales Manager, all of New York City, were in attendance. L. R. Verdon, Manager of the Kalamazoo District, will also be in charge of the new plant. Site of the new plant, in Kalamazoo township, is located southeast of the city limits and contains 106 acres. A second plant in Kalamazoo was made necessary by the expanding business of American Cyanamid & Chemical in the Kalamazoo territory and by the faith of the Corporation in the future growth of industries there located. The Company has sold its products in the Kalamazoo area for over 50 years and built its first plant in Kalamazoo 15 years ago. Policy of American Cyanamid & Chemical has been to gradually expand its plant facilities as a matter of service to its customers. Two new plants have recently been built in the South to take care of the expanding business in that territory. A total of 27 plants are strategically located throughout the country.

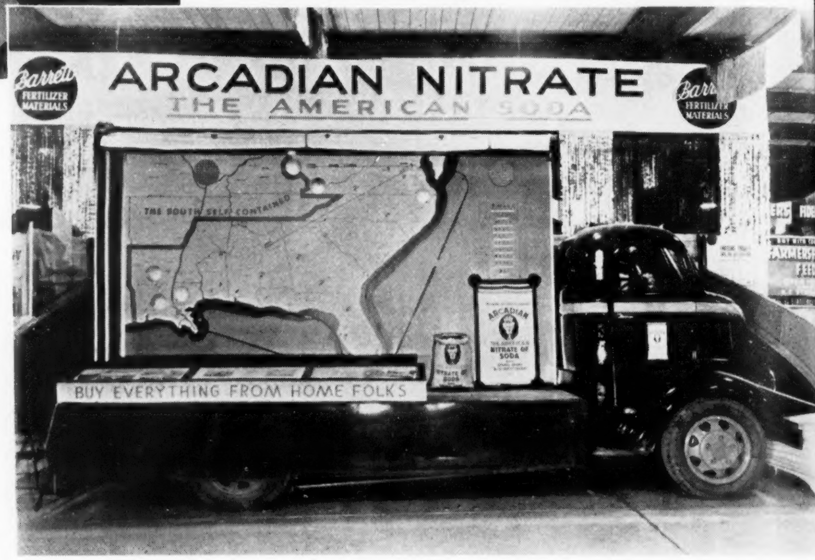
Anniversary Dinner given by George W. Merck, President, Merck & Co., Inc., to 127 employees who have been in active service for 25 to 51 years. The dinner was held at the Essex Club, Newark, December 18th. Left to right at speaker's table are: Charles A. Darius, Frederic Rosengarten, Jesse H. Ambler, George W. Merck, Adolph G. Rosengarten, Gustave Bayer and William R. Armstrong.



Samuel Berry standing at attention as Lammot du Pont, president, E. I. du Pont de Nemours and Co., reports to an audience of members of the National Association of Manufacturers that Mr. Berry is the oldest employe present: that he served the Du Pont Company for 76 years previous to his retirement last September.

Safety Pays: John J. Heck, manager of the Camden, New Jersey, plant of the Merrimac Division of Monsanto Chemical, congratulates Shipping Foreman Walter McEntee, representing Camden plant employes, on the completion of three full years of no-accident plant operation.

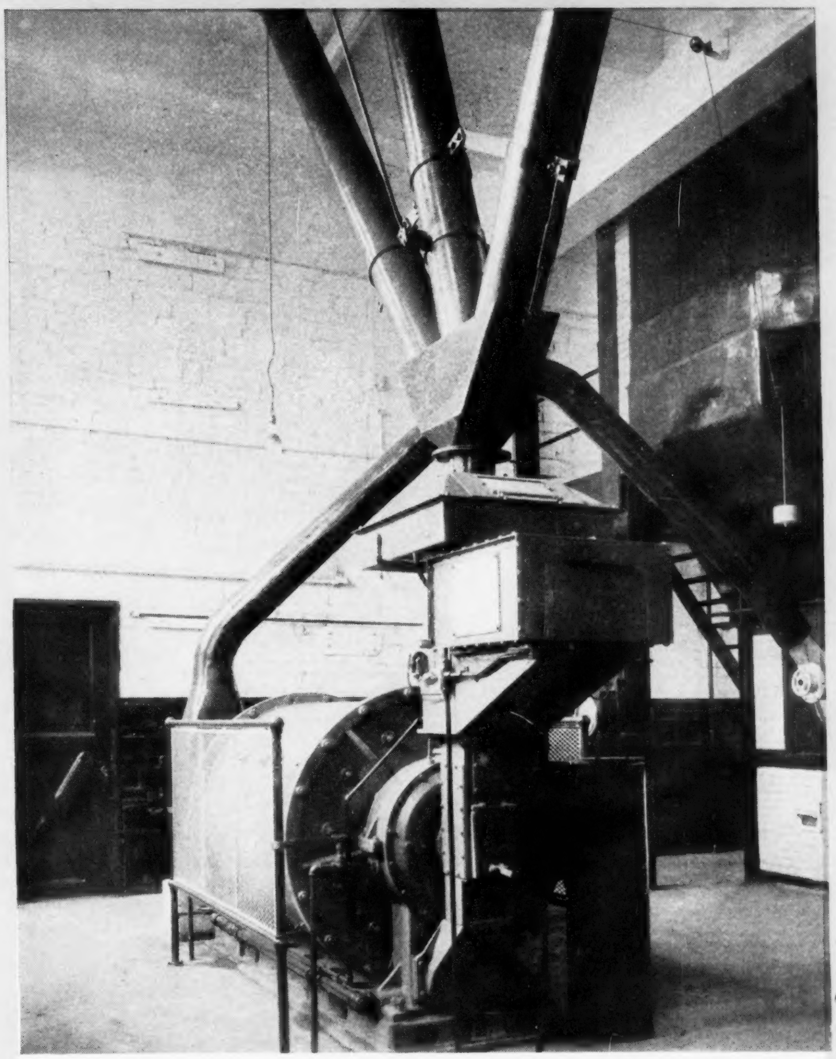
"Self-Contained": The educational exhibit entitled "The South Self-Contained," which has set attendance records in North and South Carolina recently, will go on tour in Tennessee and Arkansas in the near future, it has been announced. It is sponsored by The Barrett Company, distributors of Arcadian Nitrate, the American Soda.



To Head Nation's Chemists: Dr. William Lloyd Evans, head of the department of chemistry of Ohio State University, who has been chosen president of the American Chemical Society for 1941 by mail ballot of the Society's 24,000 members. He will serve as president-elect during 1940. Professor Evans, who holds the William H. Nichols Medal for original research on the chemistry of carbohydrates, is a native of Columbus, Ohio, and a graduate of Ohio State University and Chicago University.

Engineers in the Making: Third annual dinner of the Junior members of the American Institute of Chemical Engineers held at the Roger Smith Restaurant in New York City, December 5.

PLANT OPERATION AND MANAGEMENT



A 4′ x 6′ Kennedy Gearless Air Swept Tube Mill firing a boiler at the Niagara Falls plant of the Isco Chemical Division of Innis, Speiden & Co., Kennedy-Van Saun Manufacturing & Engineering Corporation, New York.

A DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS

The Philosophy of Design

By J. C. Lawrence

E. I. du Pont de Nemours & Co.

IN talking over, with the members of the Publication Committee of the Institute, the question of presenting a paper on Chemical Engineering Design, it seemed to me that a great many of our papers embody specific questions of design and I felt, therefore, that possibly a paper, which would apply generally to the older members of the Institute as well as to the younger members, might be of greater interest. The thoughts expressed may comprise a somewhat rambling discourse but embody, however, ideas on the subject of design philosophy which have been aired in many individual conversations with members of the Institute, during the past years.

This discussion will, naturally, concern Chemical Engineering Design, but, I believe, it will, undoubtedly, apply to all types. A design man, whether intentionally or inadvertently, must acquire a "Design Philosophy," or he becomes something else than a design man.

Philosophy, broadly speaking, is the love of wisdom. Basically, it may be called the knowledge of general principles—the elements or causes and laws governing facts and existences. Again, it may mean that calm judgment and equable temper resulting from a study of causes and laws. Or, again, it may mean fortitude in enduring suffering and reverses—and what design man worthy of the name has not, at times, agreed with that definition? But, while the term "philosophy" may carry any, and at times all, of these meanings, in connection with Chemical Engineering Design, it is my feeling that, as we must apply it, it has come to embody something more; that mental or moral attitude that arrives at conclusions based on properly visualized assumptions, as well as facts of observation, both of which must be thoroughly homogenized by such contingent knowledge as has been gained from experience.

I have "sat at the feet of the gods" at these meetings for many years and I have heard numbers of you from time to time paraphrase the words of the mad king and "offer your kingdoms for a designer." Back of that wish there must have been a thought and I often wonder just what kind of thinking we do in considering

our needs for Chemical Engineering Designers. Are we not generally prone to feel that there can be only two types from which to choose? On the one hand: those who follow the mental labyrinth of our well-known illustrator of devious paths, Mr. Goldberg; and on the other hand: those whose maximum cerebral contribution consists in their dogged determination to prove that the straight line is the shortest distance between two points? That may be a somewhat distorted picture of our thoughts regarding a design man, but there are certainly many men doing Chemical Engineering Design who fit one or the other of the above classifications. These men may be well fitted technically; they may have all the textual and fundamental information that can be drilled into them in four or five years of technical schooling—but, without that certain philosophy—that calm judgment and mental attitude that arrives surely at its destination, they are not design men. Good Chemical Engineers—yes, but possibly round pegs in square holes; that it behooves you to remove, to their and to your own eventual advantage.

Let us be more specific for a time in looking into this so-called philosophy of design. Generalities are good things from which to weave sermons, but I am afraid a sermon would not sit so well on this assemblage of hard-boiled Chemical Engineers.

Having endowed himself with that "mental attitude" which embodies our design philosophy, the design man must put it to work. Most Chemical Engineering Design problems, be they to cover the design of a complete manufacturing plant or only a single piece of operating equipment, are presented to the engineer in the form of a number of stated "requirements," *some* of which may be definite facts. Now facts are items of information, oftentimes of very nebulous ancestry, depending for their application to the problem under consideration on their source, their parentage, and the environment under which they have been developed—in which, of course, they are much like the human race. It will first, therefore, be imperative to reach far back into his philosophical equipment and determine which facts are legitimate, which are based on sound assumptions, and which are contrary to all the laws of God and man but which may, nevertheless, directly affect the matter under consideration.

Having made such differentiation, he may next find himself asked, very naively, to do the impossible; on the one hand by the owner who merely asks that a plant to produce a specified quantity of product be built; on the other hand, the operating men and the process development men who may insist that the designed capacity of each, individual piece of equipment be upped to such extent that all sorts of shutdowns and contingencies will be cared for. As compared with a designed capacity based on the six day week operation at ninety per cent. attainment of capacity, such increases in size or provision of spare equipment not only put excessive depreciation and maintenance costs on the product but tend to permit inefficient and sloppy operation. It is in the endeavor to meet such diverse demands that the definition of philosophy as "fortitude in enduring suffering" becomes very real indeed.

Beyond this point in any design problem, the design man must meet and answer innumerable questions of economics, safety, services, and such other auxiliary problems as have a bearing on the completed job. The direct problems of design, he must and can solve by the use of the basic engineering information

Paper delivered at the November Providence meeting of the American Institute of Chemical Engineers.

required in his scholastic and professional training, but even in solving these, he must be guided initially by a design philosophy which has been acquired, either partially during his preliminary professional career or wholly since beginning its practice. This philosophy requires that he answer the three essential questions of design development:

1—Shall I design individual units on a basis of average production requirements? This question pre-supposes a reasonable capital investment with such production peaks as may come from sales fluctuations being cared for by the six-day, ninety per cent. attainment specification.

2—Shall I design individual units on a basis of minimum production requirements? This provides only the minimum facilities with a consequent small investment, but necessitates the highest possible operating efficiency and constant attention to provide for peak requirements.

3—Shall I design individual units on a basis of maximum production requirements? This design basis is, of course, the dream of all operators in spite of the tremendous increase in investment necessary. It allows great leeway in production, permitting laxity with both operating labor and supervision, because the potential reserve capacity is always present.

The selection of one of these three bases for handling any problem is, of course, somewhat contingent on the owners' attitude, his financial capacity, and, eventually, on the particular operating man's ability and resourcefulness. But the important consideration is not which development may have been selected as the correct procedure, but the fact that he has acquired a philosophy which makes such selection a natural part of his design procedure.

The Younger Mind

I do not believe that such philosophy must derive from professional experience only. I am sure that many of you, who are charged with the education of our future engineers, already, either by indirection through daily contact or by direct exposition, endeavor to make their minds at least receptive to the acquisition of a philosophy or attitude of mind that will broaden their professional usefulness. But cannot this preparation be more definite, more individual, than may now be the case?

What ingredients go to make up a philosophy I am unable to say, but I am sure of one, and that one is imagination. Probably the one lack of both of the two extremes of design men mentioned earlier is the lack of imagination. Do we not find ourselves prone to call for facts, facts, and more facts to the exclusion of all else when what we really want is merely the ability to differentiate between facts and opinions or to see facts in true relationship to other facts? If there is no philosophy, no imagination, no calm judgment, then neither facts nor opinions mean anything in the consideration of a Chemical Engineering problem. Along with this philosophy of design, it is my opinion that, being human, a good designer must have the definite certainty in his own mind that of all the parts that go to make up a complete project, design is the most important.

New Processes

Electrolytic Manufacture of Persulfuric Acid

English Patent 512,966, reviewed in *Chemical Trade Journal*, Nov. 24, '39, p. 404, describes apparatus of the filter-press type (in which the electrolytic chambers are arranged in series) providing for direct cooling of the anode plates. In apparatus of this type, each of the cells, which is divided by a diaphragm, is provided with a cathode constructed in the form of a chamber through which cooling water flows, the anode being cooled by being pressed against the cathode of the adjacent cell. Patent describes cathodes in the form of trays whose open surfaces are covered by the anodes of the adjoining cells. Such a cell structure may be arranged side-by-side (filter-press arrangement) or vertically; in the latter case, the electrolyte flows by gravity through the unit. In a unit of 3 such cells, 30-35 per cent. persulfuric acid is said to be obtained with 80 per cent. current yield. Likewise, equally good results are claimed in the production of ammonium persulfate.

Production of Crystalline Lime, Magnesia Nitrates

Improvements in methods for the production of non-deliquescent nitrates of lime and magnesia are claimed in English Patent 510,053, granted to the Azogeno Societa Anonima of Genoa, Italy. Suggestions for improving these methods are based on the fact that calcium and magnesium nitrates crystallize from water with greatest difficulty, for the hydrates formed tend to produce a syrupy mass rather than to form individual particles. Crystallization difficulties are avoided, for the most part, in the patent described by spraying a supersaturated solution of the nitrate, or a supercooled melt thereof, so that the droplets fall upon a layer of the same salts, already solid and crystallized in a finely-divided state. Said layer is previously prepared by mixing with it a quantity of an ammonium salt (e.g., ammonium nitrate). As the solution is sprayed onto the crystalline layer, the latter is continuously stirred, promoting the formation of a completely crystallized and homogeneous mass of more or less regular grain size. (*Chemical Trade Journal*, Nov. 24, '39, p. 406.)

Fluorination of Benzene Compounds

Aromatic amines are converted to the corresponding fluoro-compounds by a relatively simple procedure, covered in German Patent 600,706. The amine, in anhydrous hydrofluoric acid, is simply diazotized with solid nitrite, with evolution of nitrogen. This method is an improvement over the thermal decomposition of the corresponding diazonium borofluoride, the original (Schiemann) method. Many chloromethyl benzene compounds (e. g., the xylenes and cumenes) react readily with hydrogen fluoride, usually with the assistance of a catalyst, to form the corresponding fluorine derivatives. The German literature and patents in this field are summarized in the *Chemical Trade Journal*, July 28, '39, p. 71.

Luminous Barium Sulfide Pigment

Pigment, said to be of exceptional efficiency in paint formulations, consists of a barium sulfide activated with strontium, and is claimed by its British maker, Campbell Industries, to remain luminous for a maximum of 100 hours, after activation from a light source (2 to 5 minutes in sunlight, or 5 to 10 in artificial). Resistant to heat up to 1500° C., it can be used in making bake enamels. Other paints may be made up with 5-15 per cent. pigment—the balance with cellulose acetate and methyl acrylate, or rubber derivatives, or shellac varnish.

Vallendar Clay Substitute

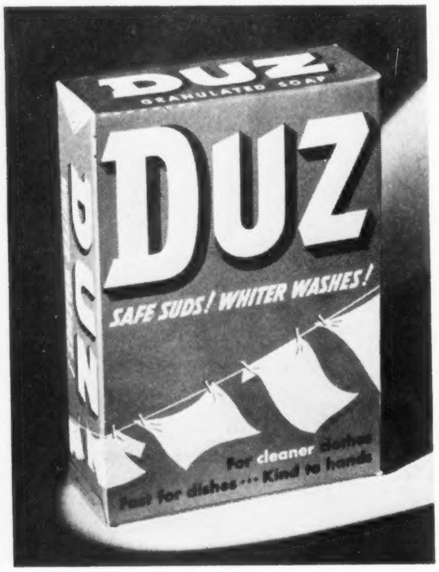
The development of an enameling clay, said to be the equal if not the superior of Vallendar clay, has been made public by an Eastern porcelain maker. This clay material has already been tested in plants throughout the country with highly satisfactory results, according to the processer. Product is treated by the "Micronizer" process, in which the average grain size of the clay particle is reduced to 3 microns—fine enough to pass through a 2500 mesh screen; ordinary Vallendar clay passes through only 250 mesh.

Packaging,

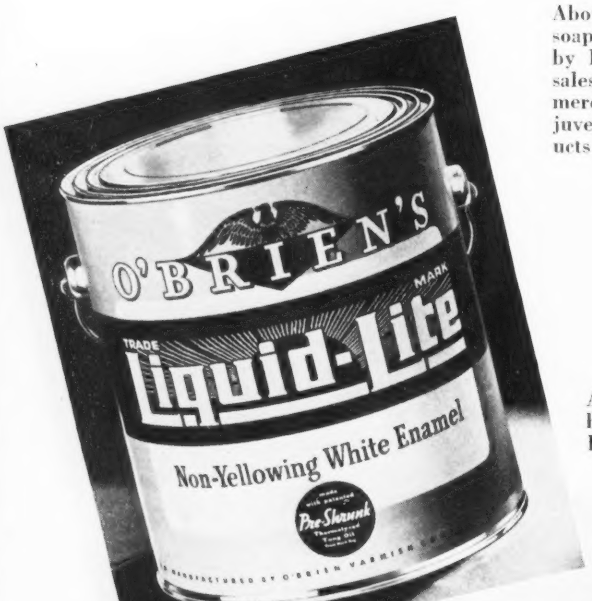
Containers

OF THE MONTH

Previously sold only under license agreements, its line of Vulcalock cements, described by the manufacturer as one of the most remarkable adhesives ever developed has now been released for sale on a restricted basis, it is announced by The B. F. Goodrich Company, Akron, Ohio.



Above, Duz, a new granulated household soap, is being marketed in selected areas by Procter & Gamble. Right, the new sales-building display stand used in merchandising the Waverly UVX-4 Rejuvenator by Waverly Petroleum Products Co., Chicago.



Liquid-Lite enamel is now being presented in a new package by the O'Brien Varnish Co., South Bend, Ind. The re-packaging affects all three of the company's Liquid-Lite enamels.

A new attractive assembly of household specialties marketed by Fuller Finish Company of Chicago.

Again extending the use of its recently introduced synthetic elastic, Koroseal, The B. F. Goodrich Company, Akron, Ohio, announces a new Koroseal paint, designated as No. 495 Korolac. A Korolac primer for use with the new paint is also introduced.

Handling and Shipping . . .

Personnel of Jury of Award of 9th Annual Competition for Irwin D. Wolf Awards Announced—Bemis Issues Valuable Booklet—Proposed Revision of Simplified Practice Recommendation R41-38 (Package Sizes for Insecticides and Fungicides) Released—

Personnel of the jury of award and details of the 9th annual competition for the Irwin D. Wolf Awards for outstanding accomplishment in packaging were announced Dec. 22 by the American Management Association, N. Y. City, sponsoring organization of the competition. All packages entered in the competition will be exhibited as a featured section of the 10th Packaging Exposition, Astor Hotel, N. Y. City, Mar. 26-29. Entries will be accepted up to the deadline of Feb. 10.

The personnel of the jury which will pass on the merits of all packages entered, includes Mrs. Katherine M. Ansley, executive secretary, of the American Home Economics Association; James C. Boudreau, director, School of Fine and Applied Arts, Pratt Institute; Allan Brown, director of public relations, Bakelite Corp.; Gordon Cole, advertising manager, Cannon Mills, Inc.; Joseph Givner, assistant to the vice-president in charge of merchandising, Sears, Roebuck and Co.; Edgar Kobak, vice-president, Lord & Thomas; C. B. Larrabee, editor, Printers' Ink Publications; Ray M. Schmitz, vice-president, General Foods Sales Co., Inc.; Miss Dorothy Shaver, vice-president, Lord and Taylor.

In making public news of the competition, A. M. A. President Alvin E. Dodd stated that "These awards have been recognized nationally by designers, consumers, and manufacturers as the foremost symbols of packaging excellence. As the American Management Association announces the 9th annual competition, the promise is that the awards will have an even wider influence than ever before upon packaging criteria and progress."

Previous Winners

In 1938, the "Rainsuiter" display carton of Leon A. Axel, Ltd., won the top prize in the Wolf competition. The Hoover Co. won the 1937 trophy with its "Ensemble Cleaner" carton and tool kit.

Insecticide Packages

The Standing Committee in charge of Simplified Practice Recommendation R41-38, Package Sizes for Insecticides and Fungicides, has approved a second revision of the recommendation to include standard size packages for nicotine sulfate, also a one-pound bag for lead arsenate, calcium arsenite, and Bordeaux mixture, and the Division of Simplified Practice of the National Bureau of Standards has submitted the proposed revision to the industry for approval.

This recommendation, which originally became effective May 1, 1926, established a simplified schedule of standard package sizes for certain agricultural insecticides and fungicides. The first revision, effective June 15, 1938, amplified the original recommendation to include standard package sizes for Basic Lead Arsenate.

The revision now proposed not only includes a list of recommended standard types and sizes of packages but the number of packages per shipping case and the territory for which each package is considered standard.

Mimeographed copies of the proposed revision may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Efficient Shipping

Bemis Bros. Bag Co., St. Louis and N. Y. City, has issued an unusual loose-leaf folder, "A Guide to More Efficient Shipping," giving information on the construction and use of water-proof bags for the shipment of bulk materials and chemicals, especially fertilizer materials.

Hartlieb Now President

J. F. Hartlieb, executive vice-president of Continental Can, N. Y. City, will succeed O. C. Huffman as president of that firm, on Feb. 1. Mr. Huffman will become chairman of Continental's executive committee.

Acidseal Paints

A 4-page catalog on its line of Acidseal Paints, derived from rubber by a process which it developed and patented, has been published by The B. F. Goodrich Co., Akron, O., and is available upon request. The subject is interesting to the engineering and contracting field because of the paints' unusual properties as protective coverings for building exteriors and interiors, concrete floors, storage plants, factories of many types, swimming pools, to protect metal supports against chlorine, and for many other uses.

Fire-Resistant Mineral Paint

Imperial Chemical Industries is reported to have developed this winter a tough, strongly flame-proof paint capable of checking damage from incendiary bombs. The British firm is said to have made practical tests of this paint, by coating beams, joists, and floors with it and exposing the treated wood to small thermite bombs. The coating mixture is claimed to be inexpensive, and effective in films of 1/16 in. in thickness.

"Kemick"

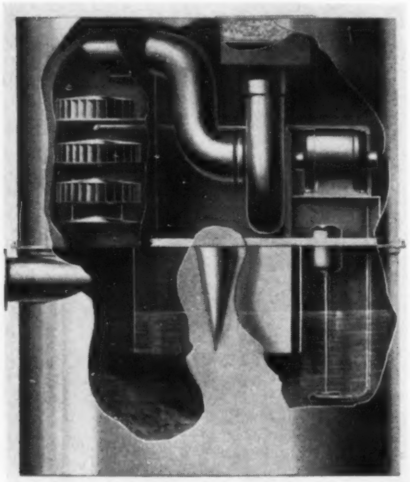
Product is a chemical rust-preventing paint for metal surfaces that are exposed to high temperatures. Especially adapted for use on engine exhaust manifolds, mufflers, and the like, it is said to adhere tenaciously to the metal surface even when the latter is red-hot.

This unique cartoon was displayed at the booth of Oliver Filters at the recent Exposition of Chemical Industries and attracted a great deal of attention.

NEW EQUIPMENT

Entrainment Separator QC 41

Midwest manufacturer now has available a device for the effective recovery of air-borne liquids. Unit has no moving parts and nothing to regulate or adjust. Atomized or entrained liquids are passed through an impingement unit of unique construction, being composed of a number of curved vanes vertically imposed upon a shelf with a central opening and with a conical section on top of the vanes, point upward. An anti-creep ring prevents the creeping of oil, etc. Separated liquid drips into a hopper at the bottom of the



unit, where it may be drawn off. The impingement unit can be flushed by passing water or other cleaning fluid just above the conical plate section, striking the point of the cone, and running over the vanes down to the bottom.

The separator is suggested for use in recovering oils, lacquers, solvents, and other sprayed materials from ventilating currents, or to free conditioned air of excess moisture after washing and cooling. It is available in sizes and types to meet conditions under vacuum, normal pressure, and plus pressure.

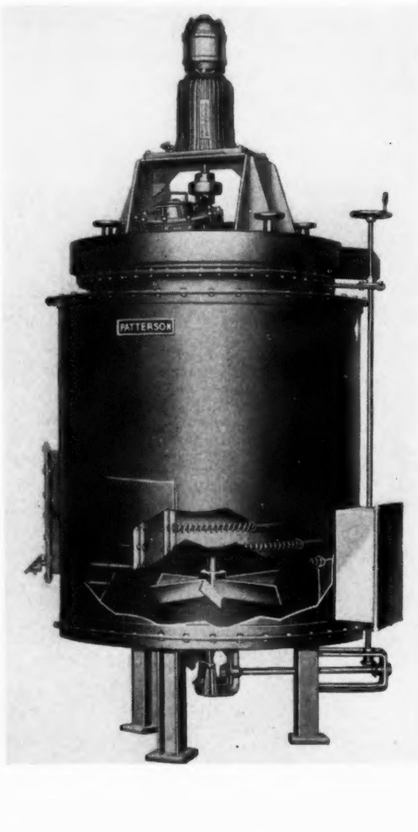
Portable Pipe Cleaner QC 42

Handy-size model weighs only 45 lbs. and has an over-all length of 17½ in. Several accessory tools are furnished with it, so that the operating head can grip ½, ⅜, and ¼ in. cable for clearing water lines from 1½ to ½ in. in diameter. The operation consists simply in fitting the desired length of coiled cable and cutter into the pipe, and rotating the cable by machine at 1100 r. p. m. The cutter can open up pipe down to ½ in., passing through 90-degree ells and either direction in tees without danger of jamming. This cleaner is also made in a larger size for handling tubing up to 6 in. in diameter. These plant accessories are used to clean out superheat tubes, oil and gas lines, heating and cooling coils, as well as water lines.

Electric Process Kettle QC 43

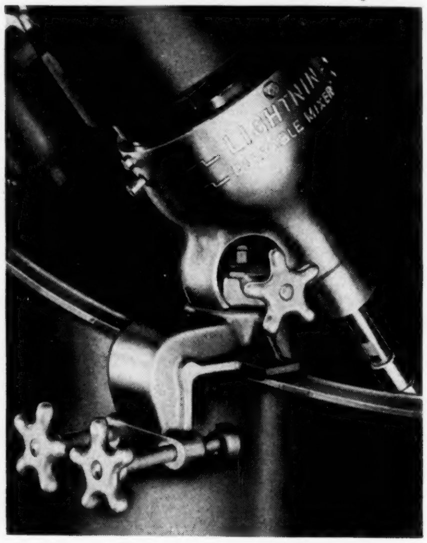
Well-known maker of chemical equipment has available a line of electric process kettles. Adjustments and repairs, or the replacement of heating elements, can be made without removing the insulating jacket. The heating units are said to afford more rapid heat-up with quick water cooling, more heat concentration per unit area, higher efficiency, unusual ruggedness, immunity from mechanical destruction, and longer life. With the rapid heat-up and quick water cooling, these vessels make possible a much shorter processing cycle than is possible with other types of kettles. The series of electric kettles can be had in plain or stainless steel and in various non-ferrous metals (e.g., copper), and is provided with various types of mixing apparatus.

In the illustration below, the wall has been cut away to show the construction of the paddle and heater elements.



Adjustable Mixer Clamp QC 44

The hand clamp, two of which are shown in an installation, is said to be readily adjustable with a turn of the hand, at the same time assuring positive locking action without the use of a wrench. An exclusive feature of this mixer clamp is the patented double wedge



with hand wheel, which is described as tightening the unit more firmly and rigidly than ever and which cannot work loose. The wedges are of bronze, the king-pin and lock-nut are cadmium plated, and the hand wheel of aluminum—which features prevent clamp "freezing" and corrosion. The wedges are fully adjustable for wear.

Fluorescent Luminaire QC 45

Now available in several sizes, a fluorescent lighting unit has proved popular for industrial illumination. The lamp itself being of high efficiency, the fixtures radiate considerably less heat than for incandescent installations of equivalent light intensity. Steel housing completely encloses reflectors (aluminum, with a specular finish on the reflecting surface), sockets, and controls, making a durable, rugged unit. The reflecting surfaces, incidentally, are prepared with either the specular or diffuse finish, the latter being furnished on the spread-type single lamp units—those with the specular coating are of the concentrating, 2-lamp design. Both ends of each luminaire are provided with knockouts for end-to-end connections to form a continuous strip, where it is necessary to flood large work areas.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 41	QC 44
" 42	" 45
" 43	

Name ....

Title .... **Company** ....

Address ....

NEW CHEMICALS FOR INDUSTRY

"Have you a nitroparaffin in your plant?" Close-up view of the dramatic presentation at the recent Exposition of Chemical Industries of Commercial Solvent's interesting new series of nitroparaffins. A few of the hundreds of the derivatives that can be produced.

Digest of Chemical Developments in Converting and Processing Fields

SYNTHETIC RESINS — The Giant that Grew Overnight!

Outstanding phenomenon of the depression decade was the amazing invasion of the coatings field by new synthetic resins.

A most valuable member of this new group of coating-resin chemicals is Maleic (Toxilic) Acid . . . first produced by National by a new process, first offered in commercial quantities by National, and first made available by National in its more convenient Anhydride form.

As the pioneer producer, it is only natural that National has accumulated an unduplicated background of technical experience and has expanded production facilities to become the principal supplier of Maleic (Toxilic) Anhydride to the resin industry.

National produces Maleic (Toxilic) Anhydride directly by controlled catalytic oxidation of benzol as a primary product, rather than as a by-product. This is your assurance of an unfailing source of supply which is never dependent upon the production of other chemicals. We invite your inquiry for samples, quotations and technical information.

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PHILADELPHIA*	200-204 S. Front St.	ATLANTA	140 Peachtree St.	TORONTO	137-145 Wellington St., W.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE WORLD

Close-up of United States Army Air Corps "Flying Fortress" showing "Plexiglas" nose and "eyeball" section.

ACRYLIC RESIN PLASTICS

By D. S. Frederick

Plastics Sales Manager

Röhm & Haas Company

ALMOST since silicate glass was first discovered, man has constantly sought to overcome its major fault—fragility. In these centuries, however, little progress had been made until the development of modified natural products like cellulose nitrate fifty years ago. Since then progress has been rapid, but it is still less than five years since the first commercial production of what is probably the best answer to date to this long search for flexible glass—the acrylic resin plastics.

The industrial development and application of the acrylic resins have been due primarily to the research of the late Dr. Otto Röhm of Darmstadt, Germany, who, with his collaborators, continuously worked with these materials for 38 years after his original publication with von Pechmann in 1901. In 1927, Bauer, working in Röhm's laboratory, developed a process which made possible the plant production of small quantities of certain acrylic acid esters, but it was not until 1935 that a solid thermoplastic resin, known as Plexiglas, was made commercially available.

These acrylic resins are polymers of derivatives of acrylic acid (CH_2=CHCOOH) and methacrylic acid. (CH_2=CH(CH_3)COOH). Of these derivatives the most important are the esters which are produced, starting with ethylene chlorohydrin, by the following reactions:

$$CH_2OH.CH_2Cl + NaCN \rightarrow \dot{C}H_2OH.CH_2CN + NaCl$$

$$CH_2OH.CH_2CN + ROH + H_2SO_4 \rightarrow CH_2{=}CHCOOR + NH_4HSO_4$$

The esters of both acrylic and methacrylic acids polymerize under the influence of heat, light, oxygen, and oxygen-yielding substances, for example sodium peroxide, hydrogen peroxide, and benzoyl peroxide. The mechanism of the polymerization of polyacrylates is believed to be similar to that of other compounds containing vinyl groups. The usual conception of the structure of these resins is that they exist as chains of various lengths formed by the linking together of the original monomeric molecules.

Since acrylic and methacrylic esters of several alcohols are available, and since the polymerization conditions including the amount of catalyst, polymerization temperature, and concentration of monomer affect the properties of the polymeric esters, acrylic resins varying from soft, sticky semi-liquids to hard, tough, thermoplastic solids can be prepared. All are characterized by extraordinary colorless transparency, stability against aging, thermoplasticity, and chemical resistance to many reagents.

When certain of the liquid esters are polymerized under the proper conditions and in special molds, Plexiglas, a crystal-clear, strong, hard solid is obtained. Because of its unusual properties Plexiglas has proven to be more than a substitute for glass. In the first place, it is clearer than glass. The most colorless crystal-clear solid known, its light transmission is so close to the theoretical maximum for a material of its index of refraction, that it is impossible to measure the difference. This clarity makes possible the "piping" of light around corners and sharp bends by a process of internal reflection. This phenomenon has been used to advantage in "cold light" medical and dental instruments which conduct light directly into the field of an operation. Recently a special material has been developed so that these instruments may now be sterilized by boiling without losing their shape.

The light weight and high impact strength has made Plexiglas popular in the aircraft field where the permanence of its clarity also represents an improvement over other available substitutes. Furthermore, it can be shaped to two- and three-dimensional curves to conform to the streamline contours of the plane and make important reductions in wind resistance. The direct result of this unusual combination of properties has been the increased use, especially in military planes, of large transparent sections which give the important tactical advantages of

clearer visibility over a wider range. The possibility of mounting Plexiglas in simple channels or drilling holes in it for bolting in light-weight frames has been an added factor in its favor.

Crystal-clear window display fixtures, spectacles, signs, tableware and even furniture have been made of Plexiglas and it has found industrial application in the construction of transparent models for testing new designs, in shatterproof inspection windows, dial covers, safety goggles, etc.

Since it is a true thermoplastic, Plexiglas may be bent to any curve, simply by heating and bending. It can be sawed or carved like wood; it can be turned on a lathe, drilled or threaded like any soft metal; it can be cemented with liquid acrylic acid for colorless joints. Flat Plexiglas is expensive but its versatility and ease of fabrication often enable finished Plexiglas pieces to compete with glass even in price.

Uses of Crystalite

These methods of fabrication are satisfactory when a relatively small number of simple pieces are planned, but for the production of a large number of identical pieces manufacturers usually turn to molding methods. For this purpose an acrylic resin molding powder known as Crystalite is prepared. The granules, at temperatures ranging from 250° to 300° F. and under pressures of 5,000 to 25,000 pounds per square inch, fuse into solid objects identical to the mold in shape and similar to Plexiglas in colorless transparency, weather resistance, and durability.

These properties have led to its wide use in the automotive field where edge-lighted speedometer dials, clocks, instrument panels and radiator ornaments are molded in Crystalite. It can be used in molded reflector buttons of high optical efficiency for highway markers and signs. Crystalite radio dials, cosmetic containers, pipe bits, trumpet mouth-pieces and lenses have also been made—all clearer than glass, more versatile, more durable.

Developments in Mold Design

The reason molding methods cannot be adapted to the production of small quantities is, of course, the cost of building molds which must be especially treated or plated to obtain highly polished surfaces. Progress in mold design, however, has been rapid and every day ingenious devices are cutting down assembly times, simplifying production methods, and making a thousand other economies which more than justify the cost of molds.

The development of molding materials has also been rapid. For example, Crystalite is now prepared in a number of types, each prepared to work at an efficient heating and cooling cycle under certain conditions of temperature and pressure. These latter conditions, of course, are determined by the condition to which the finished piece will be subjected; that is, a dial gauge to be used at 170° F. must be molded at higher temperatures than a radio dial which may never get as warm as 100° F. Crystalite to be used for compression molding must be prepared differently from powder to be used in injection molding where the material is heated to a semi-molten state before being injected under pressure into a cool mold. The area over which it must flow, the thickness of the section, the intricacy of the mold and, in injection molding, the width of the opening through which the material is forced, are among the other factors which will determine the type of Crystalite to be used.

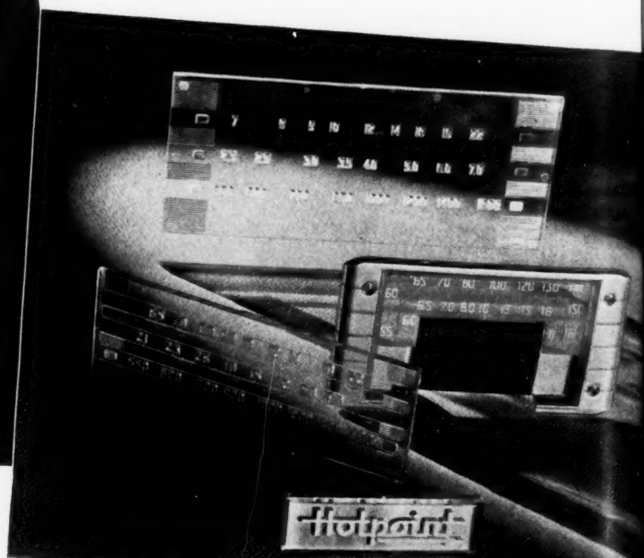
Empirical Standards Only

At the present time, the determination of the best type of molding material and the optimum conditions of molding is entirely empirical. There are no formulae, no standards by which the molders can be guided. Even without benefit of these rules of thumb, however, molding can be an extremely efficient operation. For example, while pound for pound acrylic resin molding powder is many times more expensive to manufacture than glass, economic molding and intelligent mold design have in many instances made molded Crystalite actually cheaper than glass.

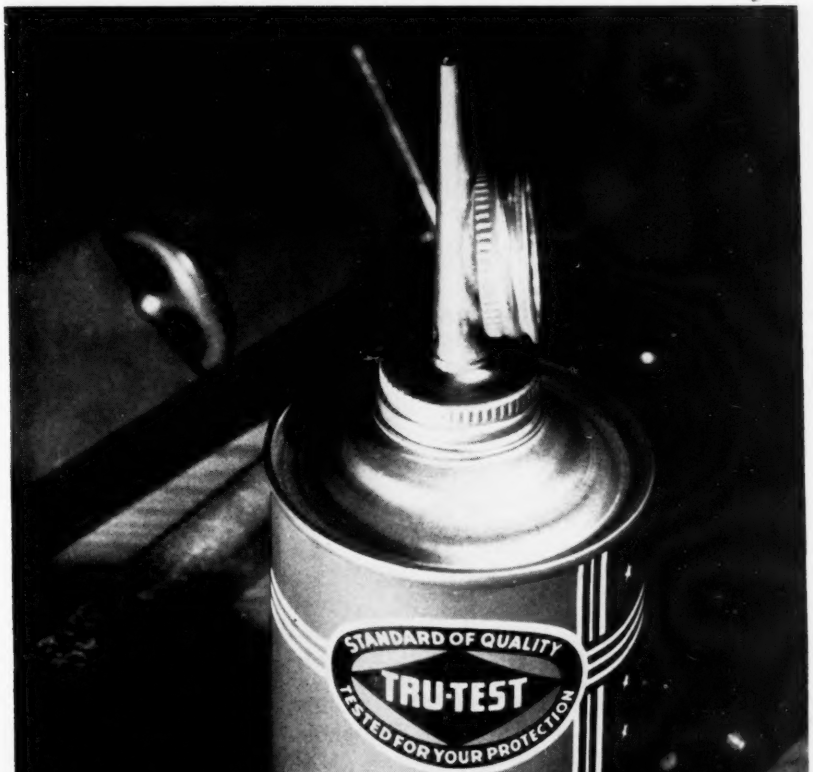
Rapid Advances in Technique

Thus rapid advances in molding technique may soon break down one of the last barriers which keeps man from complete success in his age old quest for a glass substitute. Meanwhile, acrylic resin plastics are finding their own markets in applications where glass, because of its weight or fragility, cannot be used; or where, as a substitute for wood or metal, their transparency offers important advantages.

Below, this lovely necklace of "Plexiglas" is extremely light in weight and is unbreakable. Center, the same product is used by the Curvlite Company for medical and dental instruments to permit light to be carried from a bulb in the handle directly to the point of operation. Right, General Electric radios and Hotpoint refrigerators use "Crystalite's" colorless transparency in these dials and nameplates.



CHEMICAL SPECIALTIES



Tru-Test Graphited Penetrating Oil. Product of Tru-Test Marketing and Merchandising Corporation, Chicago. Packaged in Phoenix Cone Top Can, sealed with double-cap spout, lithographed in black, red and white. *Rodney D. Heetfield Photograph.*

INDUSTRIAL · HOUSEHOLD · AGRICULTURAL

Equipment for Specialty Manufacturing

By Charles S. Glickman

Consulting Chemist

THE average person about to engage in the manufacture of a line of general chemical specialties asks two questions of his consulting chemist at the time of their first meeting. These questions are first: "What equipment will I require and how reasonably can I buy it?" and secondly, "What will you charge me for your services?". It is our intention to answer only the first one.

The primary consideration is what normally constitutes a general line of chemical specialties. Such a broad classification almost invariably includes such items as: water emulsion wax polishes, solvent wax polishes, insecticides, liquid soaps, disinfectants and/or deodorants, metal and furniture polishes and quite often automobile chemical specialty products. Secondary considerations arising out of the choice of items selected include such factors as the type of heating to be employed in "hot" processes, hot water supply, agitation, storage (raw and finished products), filling and packaging. The latter subjects: storage of finished products, packaging and filling will be left for future discussions as will also be reserved the subject of formulae.

It is of the utmost importance in these times of keen competition and relatively high equipment costs that the "set-up" of equipment recommended be flexible enough to allow of the manufacture of a variety of products and as efficient and inexpensive as possible. While there may be some conflict of opinion as to the advisability of recommending relatively high priced kettles and agitators for a cold process product such as furniture polish or insecticide, there nevertheless exists the principle of purchasing and charging "whatever the traffic will bear." There is very little doubt as to the fact that certain products can be manufactured just as well in the crudest of equipment as in the finest and it would take a crystal ball or a medium to determine which product was made under what conditions. Nevertheless, we will confine our comments and suggestions to equipment other than the crude for ethical reasons.

The requirements of process, type of agitation and heating for a general line of products is stated in Table 1.

Our next consideration is based upon the size of equipment required for the preparation of batches ranging in volume from 50-200 gallons. The additional factor of the size of agitator required is likewise included in Table 2.

While still on the subject of kettles, another factor of extreme importance is the use of either close fitting valves or flush bottom valves on the discharge outlets of the processing kettles. Oftentimes, batches are spoiled with no evidence of any apparent error either in the weighing of materials or in the actual mechanical processing. Invariably, where there are spaces present between the kettle proper and the discharge outlet, sufficient amounts of unreacted or partially reacted batch components have been present, thereby interfering with the completion of the reaction entirely or else appearing in their unreacted or partially reacted state in the balance of the finished product. This holds both for direct as well as indirectly heated kettles and the best method of avoiding any such difficulties is the use of close fitting discharge valves.

The subject of measuring out the amounts of the various components is also a matter of more than passing interest where a plant installation is being considered. In very small installations, the best method is, of course, purely physical—weighing out the components in tared pails, etc., transporting them by hand to the processing kettle and adding them at the proper time. Refinements on this method which, of course, is the crudest and most inexpensive, depend upon the use of connecting pipes extending either from large storage tanks in which the raw materials are kept or from the drums direct in which they are received. The method whereby the amounts being added can be measured are two: the first being by passage of the liquid through a meter of the proper type and capacity and secondly, the addition of the liquid directly to the reaction kettle where the amount being added can be determined by means of a calibrated stick generally supplied by the manufacturer of the equipment. It is sometimes advantageous to have a small transfer pump by means of which the contents of a drum can be pumped directly into the processing kettle through a portable filling line. Care should be taken, however, to carefully free the pump from any remaining products after being used. Soap or alkali solutions followed by water will generally effect this removal. In some cases a small amount of stock soap solution may be employed. Where it is possible, large storage tanks, each supplied with its individual discharge line to the kettle, should be used.

Table 1

Product	Process	Agitation	Heating	Amt. Hot Water Req.
Water Emulsion Polish	Hot	Rapid	Gas or Steam	Practically equal to amount of batch
Liquid Soap	Hot	Slow	Gas or Steam	Practically equal to amount of batch
Disinfectants Deodorants	Hot	Slow	Gas or Steam	Very small
Metal Polish, Furniture and Auto Polishes	Cold	Fast or Slow	None	Variable. May be cold entirely.
Insecticides	Cold	Rapid	None	None
Solvent Polishes	Hot	Slow	Gas or Steam	None

Table 2a

Product	Type[1]	Batch/ Gallons	Kettle/ Gallons[2]	Agitator /H.P.[2]
Water Emulsion Wax Polish	Thin	50	60-75	1/10
		100	110-25	1/4
		150	150-75	1/4
		200	210-25	1/3
Liquid Soap	Viscous [3]	50	same as for the above	1/2
		100		1/2
		150		3/4
		200		3/4
Disinfectants or Deodorants	Medium	50	same as for the above	1/4
		100		1/4
		150		1/2
		200		1/2
Metal, Furniture and Auto Polishes. Cold Stirred Emulsions	Variable	50	same as for the above	same as for the above [4]
		100		
		150		
		200		
Insecticides	Thin	50	practically equal to the batch being made	1/10
		100		1/4
		150		1/4
		200		1/3
Solvent Wax Polishes. Paste and/or Liquid	Variable	50	60-75	1/4
		100	110-25	1/4
		150	150-75	1/2 [5]
		200	210-25	1/2

[1] The word type corresponds to the general viscosity of the product being made while in its hot state, if a wax, or in its cold state if a liquid. Water is considered to be a thin liquid; medium oils to be medium liquids; and heavy oils, thick emulsions, etc. to be viscous liquids.
[2] In reference to the matter of agitation, the approximate H.P.'s stated are for agitators of 1720 R.P.M. It is preferable to use slow-speed agitators for viscous liquids. The special requirements for slow speed agitators are stated in the table following.
[3] Liquid soaps when prepared in their generally highest (liquid) concentration of 40% as in potash coconut oil soaps are viscous liquids and best handled with slow speed agitators to avoid excessive foam and to insure thorough mixing.
[4] In this general class of products, there is a great deal of variation as regards viscosity and suitable steps as have been outlined for materials of various viscosities should be followed in these cases.
[5] It is preferable to have agitators which are spark-proof for this type of product.

Table 2b
Operating Capacities and Dimensions of Various Kettles

Oper'g Cap.	Gross Cap.	Diameter	Depth
50 gallons	64 gallons	2′ 0″	3′ 1″
100 "	120 "	2′ 6″	4′ 3″
200 "	230 "	3′ 0″	5′ 0″

Capacity	Diameter	Depth
60 gallons	2′ 0″	2′ 3″
100 "	2′ 6″	3′ 1″
200 "	3′ 6″	3′ 10″

Oper'g Cap.	Gross Cap.	Diameter	Depth
85 gallons	105 gallons	2′ 6″	3′ 0″
125 "	155 "	3′ 0″	3′ 0″
200 "	245 "	3′ 6″	3′ 6″

Table 2c
Agitator Ratings and Propellor Sizes (Single & Dual)

Thin & Medium Liquids

H.P.	Prop. Diam. ″ Single	Dual
1/10	3	—
1/4	4	4
1/3	5	4
1/2	5	4
3/4	5	5
1	6	5

The rated R.P.M. for the above agitators is 1720.

Viscous Liquids

H.P.	Prop. Diam. ″ Single	Dual
1/3	11	8
1/2	12	8
3/4	14	11
1	16	12

The rated R.P.M. for the above agitators is 400.

Where it has been possible to obtain a pump as part of the processing or liquid handling equipment, additional beneficial use may be further derived from it. It has long been known that a pump, especially of the centrifugal type, is a rapid and effective means to thorough mixture of liquids. Where emulsions are manufactured, say furniture polishes, automobile polishes, etc., these products can be prepared in a tank or kettle and the pump connected with its inlet connected to the discharge valve of the processing vessel and its outlet passing into the vessel thereby effecting a circulatory action in the contents. In certain cases where no "shearing" action is required, a high speed pump will replace a much more expensive colloid mill. The writer recalls about the manufacturer of a white shoe polish who had the experience of using a pump with extremely fine results and where the difference in cost between the use of a colloid mill as part of the plant installation and the installed pump amounted to more than a few hundred dollars. A pump may also be employed in place of an agitator for the complete and thorough mixture of such products as insecticides and cleaning fluids, thereby saving the cost of spark-proof agitators.

With regard to the matter of storage tanks suitable for handling of raw and processed products, the following Table 3 states the dimensions and capacities of various types. It follows without further comment that knowledge of the storage tank dimensions is vitally necessary where space is at a premium.

"Hot" Processes

Where "hot" processes are employed in the manufacturing procedure, provision must be made for an adequate supply of hot water. It is generally advisable to let the party who is financing the plant decide for himself as to what type of supply he desires to have installed. It is with that view in mind, that it is preferable to locate the plant in premises which are supplied with live steam. The availability of such a steam supply simplifies the preparation of water as either of three methods of preparation may then be employed. These are namely: heating the water in a jacketed kettle, using a steam injector valve as was described by the writer in CHEMICAL INDUSTRIES, page 638, December, 1938, and lastly, using a combination of a jacketed kettle and an open steam jet as was described by the writer in *Soap*, page 127, December, 1936. The cost of an injector system which is by far the most efficient, ranges from $145-200., exclusive of installation.

When Steam Is Not Available

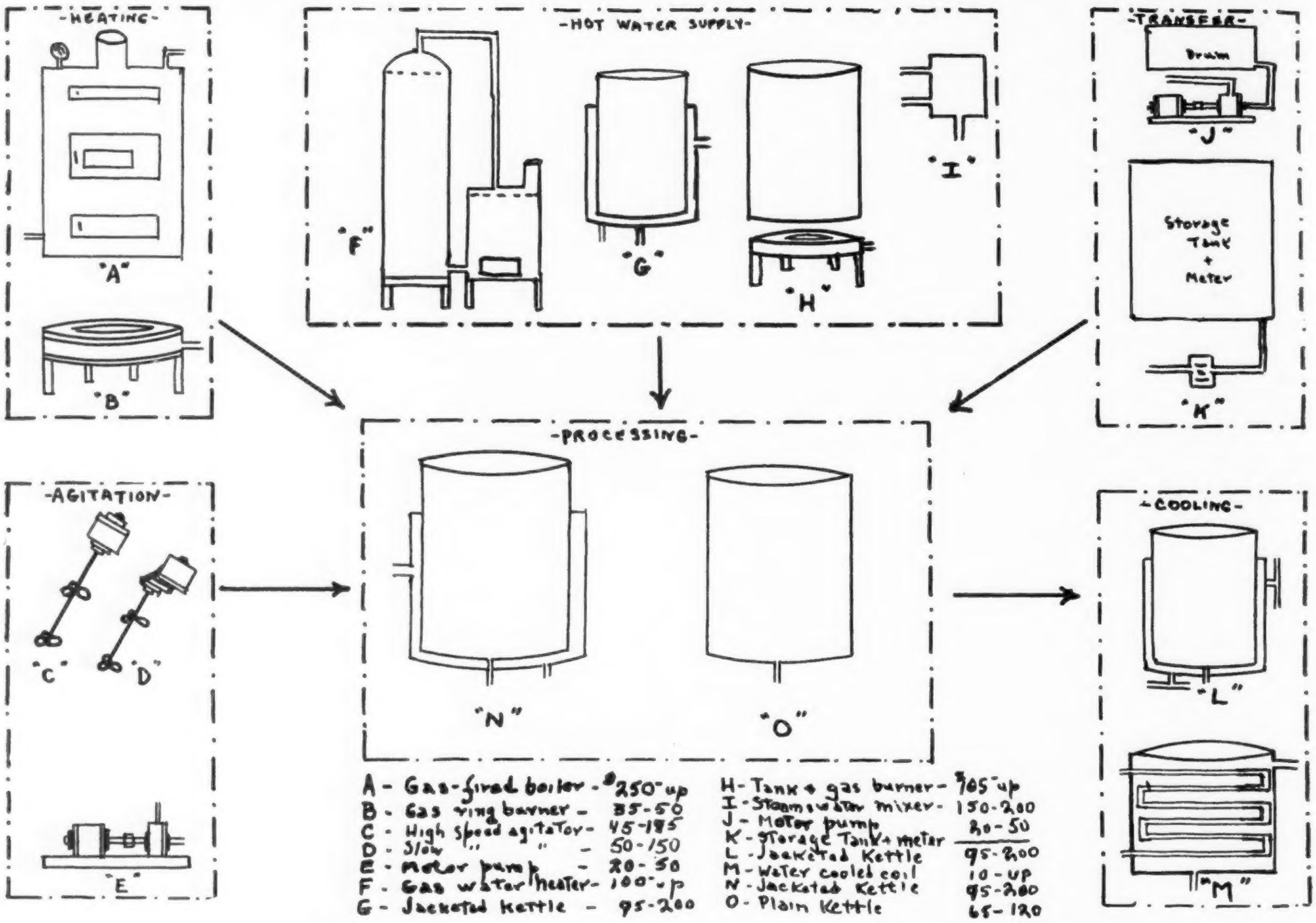
Where steam is not available and all heating must be done by gas, a simple and comparatively inexpensive arrangement may be employed, depending upon the use of a gas heated coil with a storage tank. Costs vary so greatly on this system that an average figure is difficult of statement. It may be considered, however, for all practical purposes, that about $100 representing a maximum, will cover such an installation.

Where steam is not available at service rates in the premises selected, another arrangement may be substituted which will suffice to supply sufficient amounts for jacket heating purposes. Unfortunately, the volume of steam capable of

Table 3
Approximate Capacity of Rectangular Storage Tanks

Width	Length 6′	6½′	7′	7½′	8′	8½′	9′	9½′
2′	89 gal.	97 gal.	104 gal.	112 gal.	119 gal.	127 gal.	134 gal.	142 gal.
2½′	112 "	121 "	130 "	140 "	149 "	158 "	168 "	177 "
3′	134 "	145 "	157 "	168 "	179 "	190 "	201 "	213 "
3½′	157 "	170 "	183 "	196 "	209 "	222 "	...	...
4′	179 "	194 "	209 "	224 "	...	...	...	...
4½′	201 "	218 "	...	...	...	...	...	...

Note: Figures stated for tank and kettle dimensions, agitators, etc., have been obtained from a variety of sources, chief among which are booklets prepared by equipment manufacturers. The writer will be glad to supply sources of equipment to those interested.



A visualization of the equipment required for the manufacture of a wide variety of household and industrial specialties. Chart was prepared several months ago so there may be some variation in the approximate prices shown.

being supplied by *small* gas-fired steam boilers is not sufficient to permit the use of an injector system and there remain only the alternatives of either using a jacketed kettle without any live steam inlet therein or else a gas heated water supply together with a storage tank of the proper size. These small steam boilers are extremely efficient, raising a sufficient head of steam suitable for average jacketed kettle demands within very short periods of time. They can, however, be obtained in larger and more powerful sizes capable of duplicating most any output available with regular oil fired types. These larger installations are, of course, correspondingly more expensive. The writer has had occasion to price these installations and a small but satisfactory steam supply can be obtained through this means at an outlay of a few hundred dollars. Full information can generally be obtained together with a very accurate idea of operation costs from the local gas supply company.

Where it is felt that the outlay for a steam supply represents too high an investment, direct heating by gas can be employed. This system has the distinct advantage of requiring no waiting period as does a steam supply. Burners (gas rings) of a sufficient size and heating capacity for the preparation of batches of about 100 gallons capacity can be obtained, exclusive of installation, for about \$35-50 each. While two burners may be necessary—one for the heating of the main processing kettle, and the other for the heating of the water supply kettle, this type of installation is the cheapest type that can be installed. A variation serving as an improvement on the gas heated kettle method depends upon the use of *venturi* blast burners which operate upon the principle of having the hot extended flame issue through a coiled iron or steel pipe passing through the water kettle. The flame and products of combustion are eventually led out through a flue to the open air after having given off most of their heat.

Combustible Materials

It should be realized, of course, that where combustible materials are being handled, there is an ever present risk attendant with the use of open heat. However, the writer has seen and operated many such "set-ups" without any accident or real danger, the entire method of safe operation being dependent upon due care and freedom from carelessness at all times. It should be mentioned at this point that these "rings," alluded to before, are set in concrete or concrete block or brick "enclosures" upon which the kettles are set. The additional factor, as regards cost, that these kettles are but single ones and non-jacketed tends to reduce the ultimate cost of any such arrangement.

It should be mentioned at this time that care should be exercised in the choice of the metal used for the construction of the kettle since copper and aluminum are both subject to attack by alkali with attendant discoloration of the product being made. Unless it is desirable to use stainless steel or some such similar alloy, the best and most inexpensive choice still rests with plain steel. Reasonable care exercised with steel kettles will eliminate any possible rusting or similar discoloration either of the kettle or contents.

In further comparison of direct heated and jacketed kettles, the use of jacketed kettles allows of the use of a cooling system wherein the jacket after being freed from steam and disconnected from the steam system is used for cooling purposes with a resultant saving of time and continued agitation. Cooling systems are possible, however, even with the direct heated type of kettle by having the hot processed batch pass through a "worm coil" or steel pipe immersed in cold running water on its way from the production kettle to the filling machine or the storage tank.

New Trade Marks of the Month

ORTHOTONE
422,199

BRILLIANT PENN 100% PURE PENNSYLVANIA
422,212

Ferri-Floc
422,220

Sprint
422,239

DURIUM
422,243

"N B C"
422,244

THIOLENE
422,246

Rust Master
422,268

NAF-SOL MAKES ANY SOAP A NAPHTHA SOAP
422,277

GUARDSMAN
422,282

Clarathin
422,310

HYDROSCENT
422,341

A PLOMOCITE PRODUCT Vue
422,377

K M best in asbestos
422,362

TECTYL
422,418

FALO
422,422

TUPCO
422,427

SUPER SNOW
422,453

GroLeaF
422,464

PROTEK-SORB
422,466

TITAN
422,494

MICIDE
422,502

MARATHON
422,519

"LUBRICOATING"
422,583

Kool-Flo
422,600

NuREXFORM
422,621

AROCHEM
422,677

AROPLAZ
422,676

AROTHETICS
422,678

HAVEG
422,746

SIXOPINE
422,790

MINTODA
422,791

CLARIFEX
423,092

GULF
423,168

ZIN-PHO
423,771

CURTEX
423,726

COSCON
423,593

Trade Mark Descriptions†

422,199. Thomas S. Curtis Labs., Huntington Park, Calif.; Aug. 2, '39; for photographic chemicals; since Apr. 19, '39.
422,212. Johnson Oil Refining Co., Chicago, Ill.; Aug. 2, '39; for motor oil; since June 10, '39.
422,220. Tennessee Corp., N. Y. City; Aug. 2, '39; for preparation for eliminating wastes, etc., from industrial and sewage waste liquors; since May 1, '39.
422,239. General Printing Ink Co., N. Y. City; Aug. 3, '39; for printing ink; since July 1, '39.
422,243. Fuller Finish Co., Chicago, Ill.; Aug. 3, '39; for all-purpose liquid protective varnish; since July 18, '39.
422,244. Fuller Finish Co., Chicago, Ill.; Aug. 3, '39; for liquid all-purpose cleaner; since July 18, '39.
422,246. Hawkins Food Processing Co., Seattle, Wash.; Aug. 3, '39; for color preservative for foodstuffs, comprising a liquid chemical composition; since Aug. 1, '39.
422,268. Rust Master Chem. Corp., Boston, Mass.; Aug. 4, '39; for automobile radiator cleaning fluid and for chemical rust-proofing solution; since July 18, '39.
422,277. Dr. André Lab., Milwaukee, Wisc.; Aug. 4, '39; for a general washing and cleaning preparation; since July 15, '39.
422,282. Grand Rapids Varnish Corp., Grand Rapids, Mich.; Aug. 4, '39; for general industrial finishes; since July 20, '39.
422,310. French-Wolf Paint Prods. Corp., Phila., Pa.; Aug. 3, '39; for thinner, mixer, and diluting material for paint, varnish, lacquer, shellac, and dope; since May 29, '39.
422,341. John Powell & Co., Inc., N. Y. City; Aug. 5, '39; for water-soluble perfume oils; since July 18, '39.
422,377. Plomocite Prods., Inc., Denver, Colo.; Aug. 7, '39; for fluid composition for cleansing glass and similar surfaces; since July 1, '39.
422,362. Keasbey & Mattison Co., Ambler, Pa.; Aug. 7, '39; for magnesium carbonate and magnesium oxide; since Oct. 1, '37.
422,418. Potomac Chem. Co., Inc., Washington, D. C.; Aug. 8, '39; for corrosion-preventing preparation for metals, having also lubricating qualities; since Aug. 2, '39.
422,422; 422,427. Turner-Pfister Chem. Corp., Ridgefield, N. J.; Aug. 8, '39; for moth-proofing compositions; since June 29, '39.
422,453. Standard Industrial Prods., Inc., Evansville, Ind.; Aug. 9, '39; for cleanser having water-softening properties; since May, '39.
422,464. Cooperative G. L. F. Soil Building Service, Inc., Ithaca and N. Y. City; Aug. 10, '39; for fertilizers; since Apr. 1, '31.
422,466. The Davison Chem. Corp., Baltimore, Md.; Aug. 10, '39; for compound for dehumidification of package interiors; since Aug. 2, '39.
422,494. Swift & Co., Chicago, Ill.; Aug. 10, '39; for glue; since July 12, '39.
422,502. Pauline Adams Archer (Archer Chem. Co.), Grand Rapids, Mich.; Aug. 11, '39; for insecticides; since June 23, '38.
422,519. Ohio Oil Co., Findlay, O.; Aug. 11, '39; for motor oil, kerosene, fuel and lubricating oils, and greases; since July 19, '39.
422,583. Herman Epstein (Steel Mills Compounds Co.), Kansas City, Mo.; Aug. 14, '39; for anti-friction coating compounds for metals being extruded; since July 5, '39.
422,600. Ralph W. Rice (Kool-Flo Sales Co.), Kansas City, Kans.; Aug. 14, '39; for lubricating oils and greases; since July 21, '39.
422,621. E. I. du Pont de Nemours and Co., Wilmington, Del.; Aug. 15, '39; for insecticides; since Feb. 17, '30.
422,676-7. Stroock & Wittenberg Corp., N. Y. City; Aug. 16, '39; for alkyd synthetic resins (No. 422,676), and for modified phenolic and other modified synthetic resins (No. 422,677); since Aug. 2, '39.
422,678. Stroock & Wittenberg Corp., N. Y. City; Aug. 16, '39; for synthetic resins; since July 31, '39.
422,746. Haveg Corp., Newark, Del.; Aug. 18, '39; for corrosion resistant chemical compound; since 1932.
422,790. West Disinfecting Co., L. I. City, N. Y.; Aug. 19, '39; for pine disinfectant; since Aug. 1, '39.
422,791. West Disinfecting Co., L. I. City, N. Y.; Aug. 19, '39; for deodorizing fluid; since Aug. 2, '39.
423,092. Gevaert Phot-Producten, Naam. Ven. (Photo-Produits Gevaert, S. A.), Oude-God, Belgium; Aug. 29, '39; for photographic chemicals; since May 1, '39.
423,168. Gulf Oil Corp., Pittsburgh, Pa.; Aug. 31, '39; for various chemical specialties.
423,771. Mobile Paint Co., Inc., Mobile, Ala.; Sept. 20, '39; for semi-paste paints and liquid paints; since July, 1925.
423,726. Curtain-Howe Corp., N. Y. City; Sept. 19, '39; for compositions for imparting corrosion resistant and bonding properties to metal surfaces; since Aug. 15, '39.
423,593. The Conewango Refining Co., Warren, Pa.; Sept. 14, '39; for refined mineral for technical use in the mfr. of cosmetic and pharmaceutical products; since July 1, '39.

† Trademarks reproduced and described cover those appearing in the *U. S. Patent Gazettes*, Oct. 21 to Nov. 14, inclusive.

Opens Textile Laboratory

Fred A. Mennerich has opened a laboratory at 42 Roosevelt ave., Jersey City, N. J., devoted exclusively to the microscopical investigation of routine and research problems in the textile field. Mr. Mennerich is a graduate of the Univ. of Wisconsin and a Fellow of the New York Microscopical Society, of which he has been secretary for 3 years. He has been conducting classes on textile microscopy for members of the Society at the N. Y. Museum of Natural History.

"D-Y" Salesmen Meet

Twenty salesmen of the Davies-Young Soap Co., Dayton, O., gathered at company's headquarters during the week of Dec. 11 for a sales clinic on dry cleaning and laundry soaps.

New Trade Marks of the Month

Lusterized
371,357

La France
371,602

Trustworthy
371,905

HEAVY DUTY
371,908

THE "LIFETIME BEAUTY" PROCESS FOR YOUR CAR
371,913

PITTSBURGH PAINTER LINE
371,919

COLUMBIA
372,257

COLUMBIA
372,263

French SHOE SOAP
371,923

Colmar
372,290

weather glaze
372,291

Photo-Fine
372,293

O-SO-EZY
380,406

C.F.DEL C.
410,295

SORBO
411,516

"Bull Frog"
412,283

MARCO PRODUCTS
416,859

Toilex
419,780

GARD
PROTECTS your HEALTH
420,186

PMC
420,525

RAYOX
420,984

KOLODIP
421,095

DUPONT
421,223; 421,226

OVER-NITE
421,490

Oleacid
421,575

FERA-FLOW
422,086

DLO
422,137

DLON
422,138

CRYSTEX
422,158

BEE BRAND
422,177

FREOL
422,194

(Trade Mark Descriptions Continued)

371,357. Not subject to opposition. Louis J. McAtee, Spokane, Wash.; Mar. 13, '39; for chemical cleaning fluid and a powdered cleaning preparation, both of which are used in the dry cleaning of fabrics; since Nov. 1, '35.

371,602. La France Shoe Polish Co., Inc., Highland, Ill.; Dec. 3, '38; for shoe and other leather polishes and cleansers; since July, '29.

371,905. Not subject to opposition. Supplee-Biddle Hardware Co., Phila., Pa.; June 21, '39; for ready-mixed paints, varnishes, and paint enamels; since Mar. 7, '38.

371,908. Not subject to opposition. Panther Oil & Grease Co., (The Zone Co.), Fort Worth, Tex.; May 11, '39; for lubricating oils and greases; since Oct. 19, '37.

371,913. Not subject to opposition. Ivano, Inc., Chicago, Ill.; Sept. 9, '38; for automobile body paste cleaner and polish; since July 14, '38.

371,919. Not subject to opposition. Pittsburgh Plate Glass Co., Pittsburgh, Pa.; for liquid and paste paints, paint primers, enamels, lacquers, and varnishes; since July 1, '38.

371,923. Not subject to opposition. Harry W. Ramsay (A. T. Cleveland Mfg. Co.), Boston, Mass.; Apr. 2, '37; for shoe cleaning preparation; since June, '31.

372,257. Not subject to opposition. Columbia Alkali Corp., Barberton, O.; May 23, '38, drawing is lined for blue and white; for sodium bicarbonate U. S. P.; since Apr. 26, '38.

372,263. Not subject to opposition. Columbia Alkali Corp., Barberton, O.; Aug. 23, '38; drawing is lined for blue and white; for caustic soda, soda ash, liquid chlorine, bicarbonate of soda, caustic ash, and modified sodas; since July 25, '38.

372,290. Not subject to opposition. Rosa E. Tuttle, Newark, N. J.; June 24, '39; for mercury triple-distilled from scrap amalgam; since Jan. 1, 1900.

372,291. Not subject to opposition. Fred G. Coxen (Excelda Mfg. Co.), Ferndale, Mich.; June 29, '39; for polish and polishing wax; since March, '37.

372,293. Not subject to opposition. Fink-Roselieve Co., Inc., New York City; July 27, '39; for photographic preparations and chemicals; since Oct. 26, '36.

380,406. O-Cedar Corp., Chicago, Ill.; to Reconstruction Finance Corp., Chicago, Ill., June 29, '36; for polishes and waxes; since Sept. 30, 1913.

410,295. La Forestal Argentina, Soc. An. de Tierras Maderas y Explotaciones Comerciales E Industriales, Buenos Aires, Argentina; Sept. 6, '38; for extracts used in the tanning industry; since 1906.

411,516. Atlas Powder Co., Wilmington, Del.; Oct. 12, '38; for industrial sorbitol syrups; since Sept. 9, '38.

412,283. Charles D. Berman (Berman Chemical Co.), Toledo, O.; Nov. 2, '38; for cleaning preparations for the home; since 1915.

416,859. Maher Color & Chem. Co., Inc., Chicago, Ill.; Mar. 9, '39; for dyestuffs and bulk oils for use in mfr. shampoos.

419,780. Vestal Chem. Co., St. Louis, Mo.; May 24, '39; for cleanser for toilet bowls, traps, etc.; since May 1, '31.

420,186. Protectol Co., Inc., Chicago, Ill.; June 5, '39; for disinfecting preparations for general cleansing purposes; since Sept., '38.

420,525. Hercules Powder Co., Wilmington, Del.; June 15, '39; for rosin size (sodium resinate) and for commercial alum (aluminum sulfate); since May 30, '39.

420,984. Edward J. Mraz (Rayox Sales Co.), Cleveland, O.; June 26, '39; for sodium hypochlorite solution, water softener, and cleanser; since Dec. 18, '35.

421,095. Niagara Sprayer and Chem. Co., Inc., Middleport, N. Y.; June 29, '39; for animal dip controlling parasitic diseases; since June 29, '38.

421,223. E. I. du Pont de Nemours and Co., Wilmington, Del.; June 30, '39; for various chemicals and chemical specialties; since June, 1917.

421,226. E. I. du Pont de Nemours and Co., Wilmington, Del.; June 30, '39; for battery zinc, gold hydrate, indium, nonferrous metal alloys and anodes; since Sept., '28.

421,490. James Laurens Nicholes, Phila., Pa.; July 12, '39; for rat and roach exterminators; since May, 1916.

421,575. National Oil Prods. Co., Harrison, N. J.; July 14, '39; for sulfated and sulfonated organicals, as intermediates for the cosmetic and pharmaceutical trades, and for industrial use as wetting and emulsifying agents; since July 11, '39.

422,086. American Abrasive Metals Co., N. Y. City; July 29, '39; for free-flowing paint preservative coating; since June 28, '39.

422,137-8. The Lubri-Zol Corp., Wickliffe, O.; July 31, '39; for lubricating oils, greases, and motor lubricating oils; since: (422,137) Jan. 29, '38; (422,138) June 20, '39.

422,158. Stauffer Chem. Co., Inc., San Francisco, Calif., and N. Y. City; July 31, '39; for sulfur; since May 1, '39.

422,177. McCormick & Co., Inc., Baltimore, Md.; Aug. 1, '39; for disinfectants; since May 1, '38.

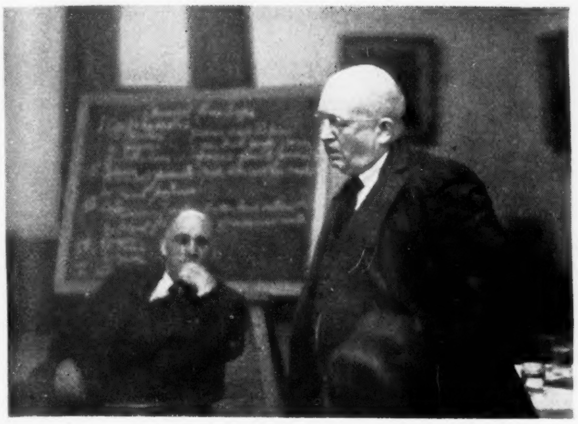
422,194. Barton-Grimsley Corp., Los Angeles, Calif.; Aug. 2, '39; for lubricating oils and greases; since July 6, '39.

Barbour Co. Formed

Ross Barbour, formerly sales manager of Cataract Chem. Co., Buffalo, N. Y., has organized in St. Louis the Barbour Co., which will specialize in the formulation of chemical preparations for treating shoe leather and other leather goods.

"Lew" Schaeffer is now representing Carman Co., Inc., of St. Louis, in the east Texas districts, including Houston and Galveston.

C. S. Carter has been elected president of Liquid Carbonic Corp., Chicago, to succeed the late W. A. Brown.

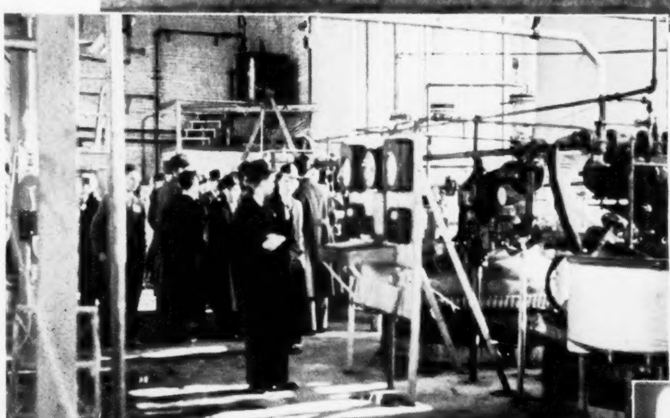


Prof. Arthur W. Hixson, Columbia, left, and Prof. Ralph H. McKee, also of Columbia, were among the speakers at the November meeting of the N. Y. Section, A. I. Ch. E., held at the Faculty Club of Columbia University, in conjunction with the celebration of the 75th Anniversary of the founding of the Engineering School.

Chemists' Club members honor S. Willard Jacobs (vice-president, Electro Bleaching Gas) for his long and successful efforts in behalf of the club in the position of Chairman of the House Committee. Seated at the speakers' table, left to right, Dr. W. M. Grosvenor, Dr. Maximilian Toch, W. J. Orchard (Wallace & Tiernan), Dr. Lewis H. Marks (toastmaster), and Dr. Frederick M. Becket, president of the Club.

"Bob" Quinn, Mathieson Alkali, the new chairman of the House Committee, exhibits the symbols of his office.

A few of the Philadelphia and Wilmington chemical engineers who visited Atlas Powder Co.'s sorbitol and mannitol plant recently at Atlas Paint, Del.

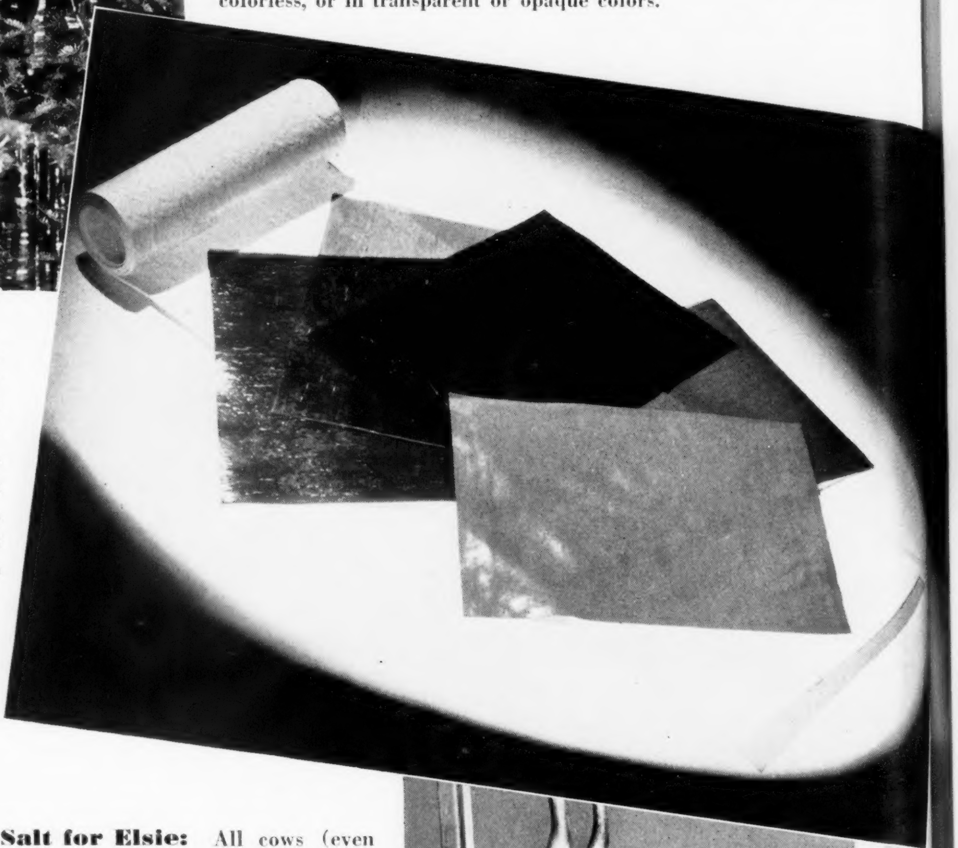


Engineers were conducted through the plant in groups of about 20. Here is one of the groups inspecting recovery equipment.

"South America: Neighbor and Customer." Chemists' Club Symposium attracted a large audience on November 21. Standing, S. D. Kirkpatrick, Editor, *Chem & Met* who acted as toastmaster; next, James S. Carson, authority on Latin-American problems; at the extreme right, William T. Moran, assistant vice-president, The National City Bank.

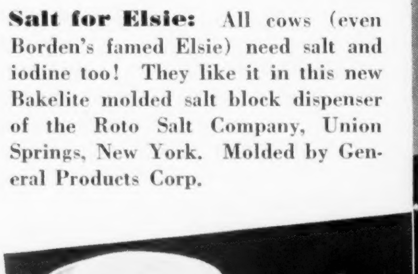
Santa Claus Aid: Decorating the Christmas tree was easier this year because the new American Christmas tree balls are stronger. They are just as beautiful but the little metal cap by which they are hung on the tree holds tight. Then too, the new American balls are stronger because they are exactly round—perfect spheres. Corning Glass Works developed the improved Christmas tree ornaments to take the place of imports cut off from abroad.

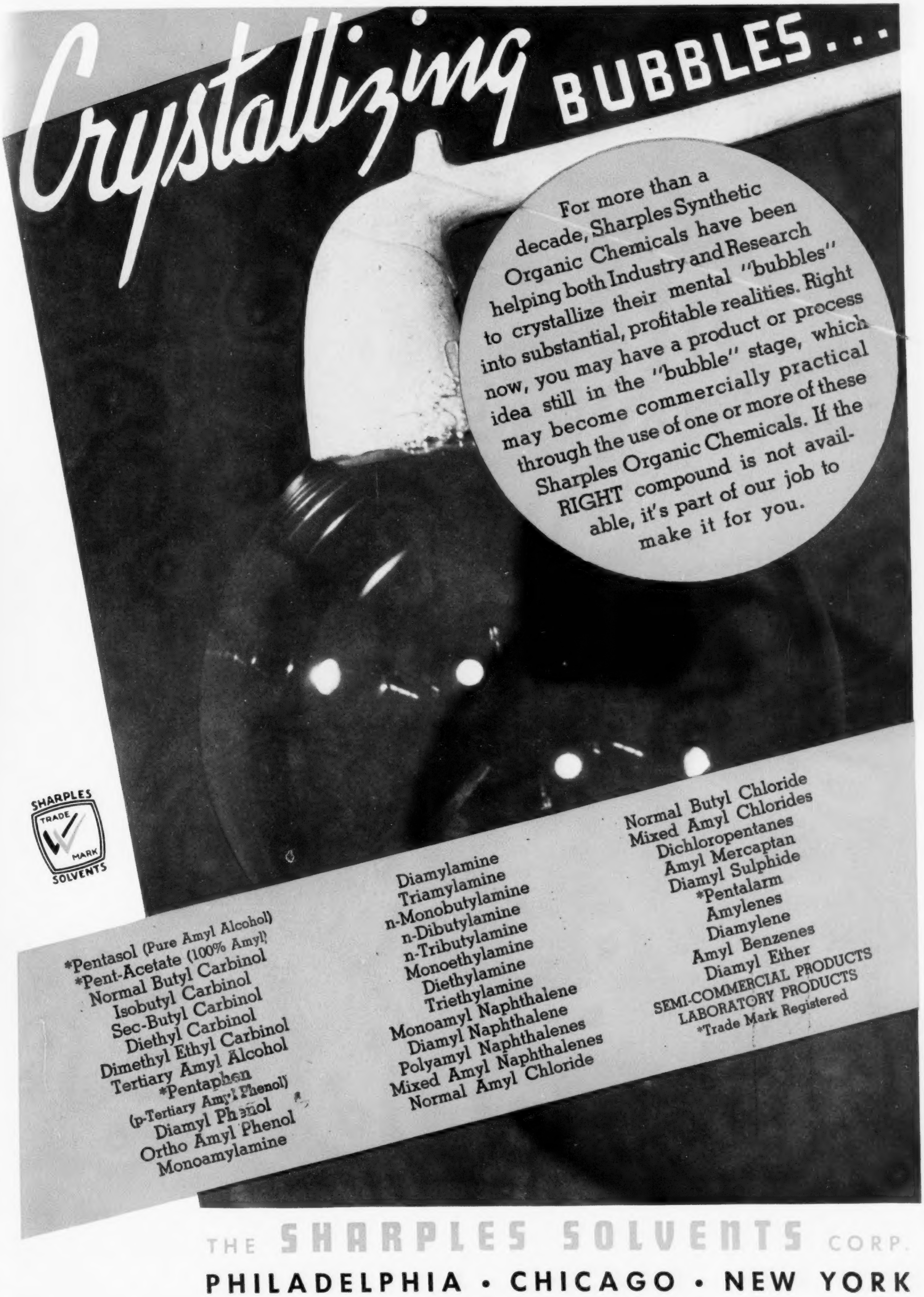
Carbide and Carbon Chemicals Corporation, a unit of Union Carbide and Carbon Corporation, has developed calendered sheets of "Vinylite" plasticized resins which have many of the advantages, and few of the disadvantages, of leather and rubber. These sheets offer possibilities for numerous applications heretofore removed from the plastics industry. The material—suitably plasticized copolymers of vinyl chloride and vinyl acetate—can be supplied colorless, or in transparent or opaque colors.



Fashion Hint?: Work garments of "Fairprene" fabrics, such as the overall suit illustrated, are now being coated with neoprene chemical rubber, a product of the Du Pont Company, which gives the clothing resistance to gasoline, oils, solvents, and greases.

Salt for Elsie: All cows (even Borden's famed Elsie) need salt and iodine too! They like it in this new Bakelite molded salt block dispenser of the Roto Salt Company, Union Springs, New York. Molded by General Products Corp.





Crystallizing BUBBLES...
For more than a decade, Sharples Synthetic Organic Chemicals have been helping both Industry and Research to crystallize their mental "bubbles" into substantial, profitable realities. Right now, you may have a product or process idea still in the "bubble" stage, which may become commercially practical through the use of one or more of these Sharples Organic Chemicals. If the RIGHT compound is not available, it's part of our job to make it for you.
SHARPLES TRADE MARK SOLVENTS
*Pentasol (Pure Amyl Alcohol)
*Pent-Acetate (100% Amyl)
Normal Butyl Carbinol
Isobutyl Carbinol
Sec-Butyl Carbinol
Diethyl Carbinol
Dimethyl Ethyl Carbinol
Tertiary Amyl Alcohol
*Pentaphen
(p-Tertiary Amyl Phenol)
Diamyl Phenol
Ortho Amyl Phenol
Monoamylamine
Diamylamine
Triamylamine
n-Monobutylamine
n-Dibutylamine
n-Tributylamine
Monoethylamine
Diethylamine
Triethylamine
Monoamyl Naphthalene
Diamyl Naphthalene
Polyamyl Naphthalenes
Mixed Amyl Naphthalenes
Normal Amyl Chloride
Normal Butyl Chloride
Mixed Amyl Chlorides
Dichloropentanes
Amyl Mercaptan
Diamyl Sulphide
*Pentalarm
Amylenes
Diamylene
Amyl Benzenes
Diamyl Ether
SEMI-COMMERCIAL PRODUCTS
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THE SHARPLES SOLVENTS CORP.
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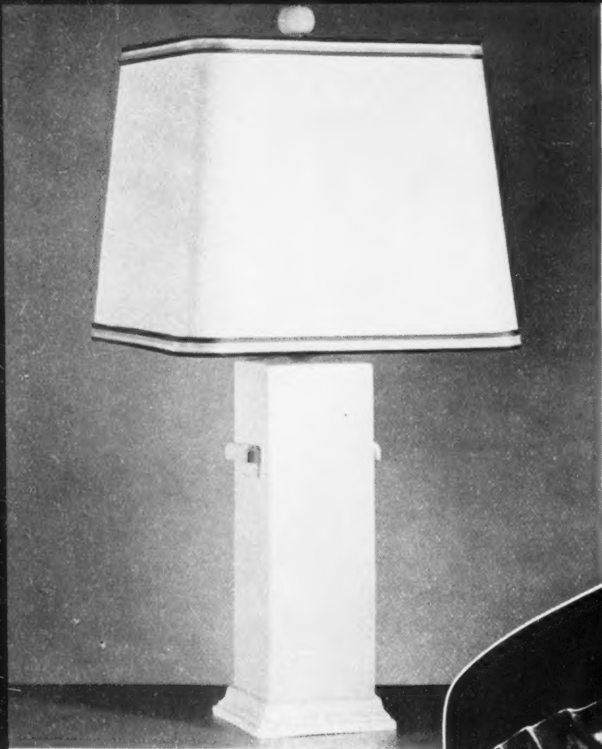
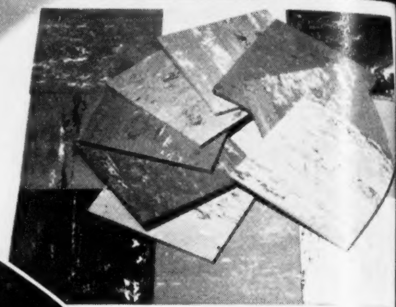


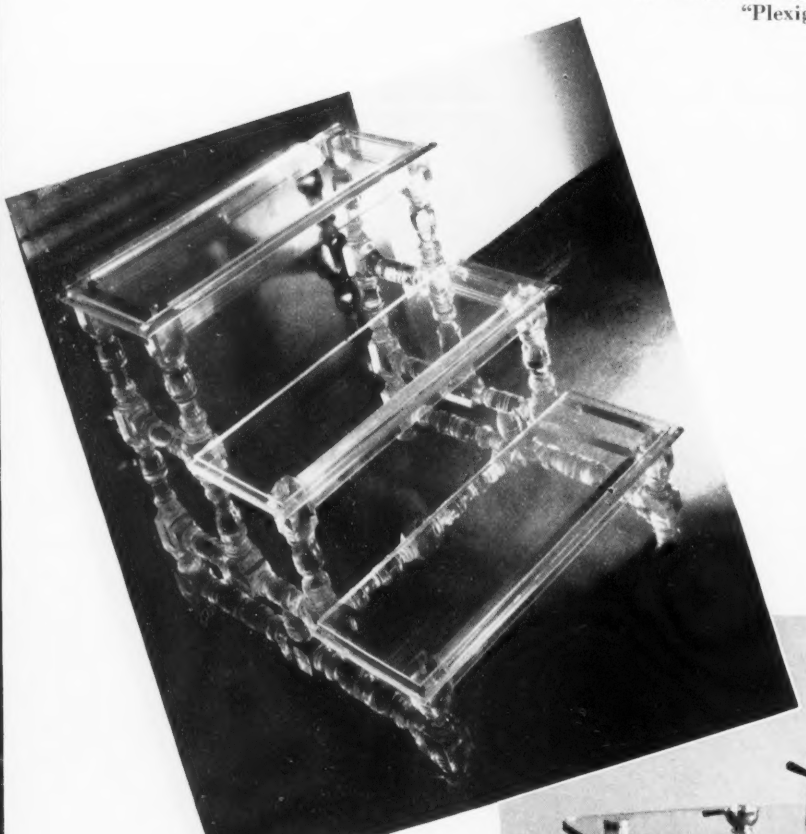
A few of the very interesting exhibits of what can be done in plastics shown at the recent annual dinner at the Waldorf in New York City, given by *Modern Plastics* to honor the 62 winners in that magazine's "Plastic Placque" Competition.

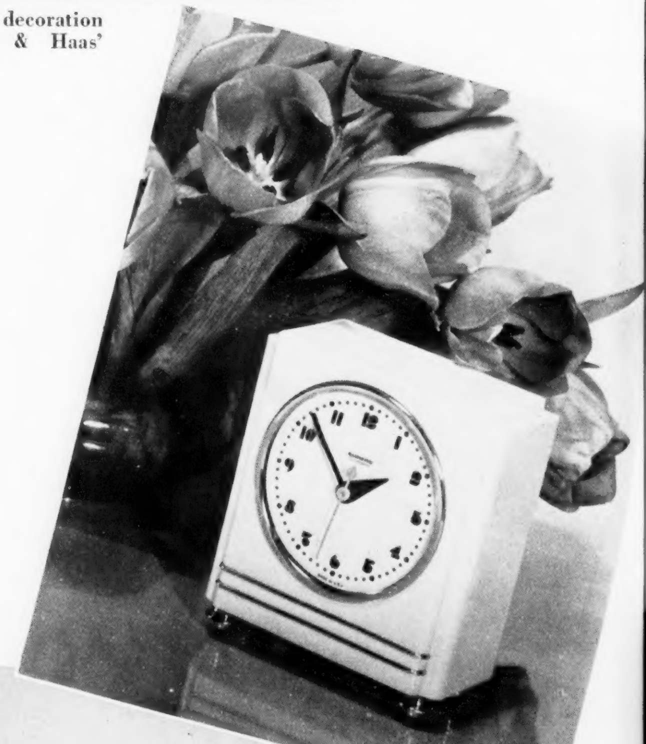


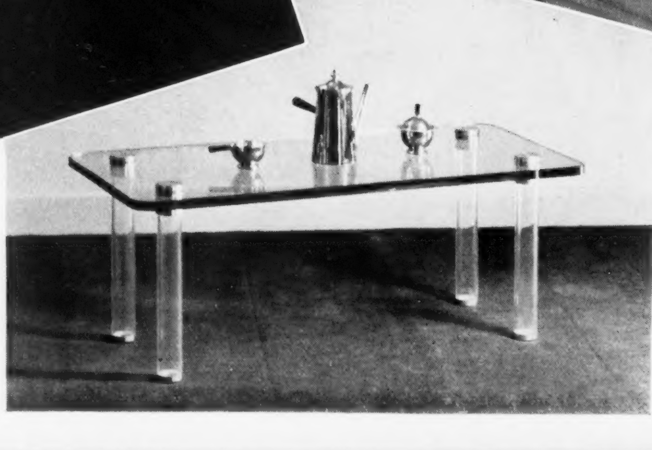
A Bakelite product was one of the materials out of which this illuminated house number was molded. Below, flooring blocks bonded with "Vinylite"—made by Carbide & Carbon Chemicals.

Chastely simple, this modern lamp of white china has a white "Lumarith" Clair de Lune shade—product of Celluloid Corporation.

This attractive table decoration is made of Röhm & Haas' "Plexiglas."







Above, another interesting example of the possibilities of plastics made of "Plexiglas." Right, the legs of this coffee table are "Lucite"—a Du Pont material.

The clock shown above has its case molded of Beetle—Beetleware is a product of American Cyanamid.

NEWS OF THE MONTH

News Index

At the 44th Congress of American Industry

Howard Coonley (left), president of The National Association of Manufacturers, and Edgar M. Queeny, president, Monsanto, pictured at the opening session, Waldorf-Astoria, New York, December 6.

Acme

IN REVIEW

CHEMICAL INDUSTRIES

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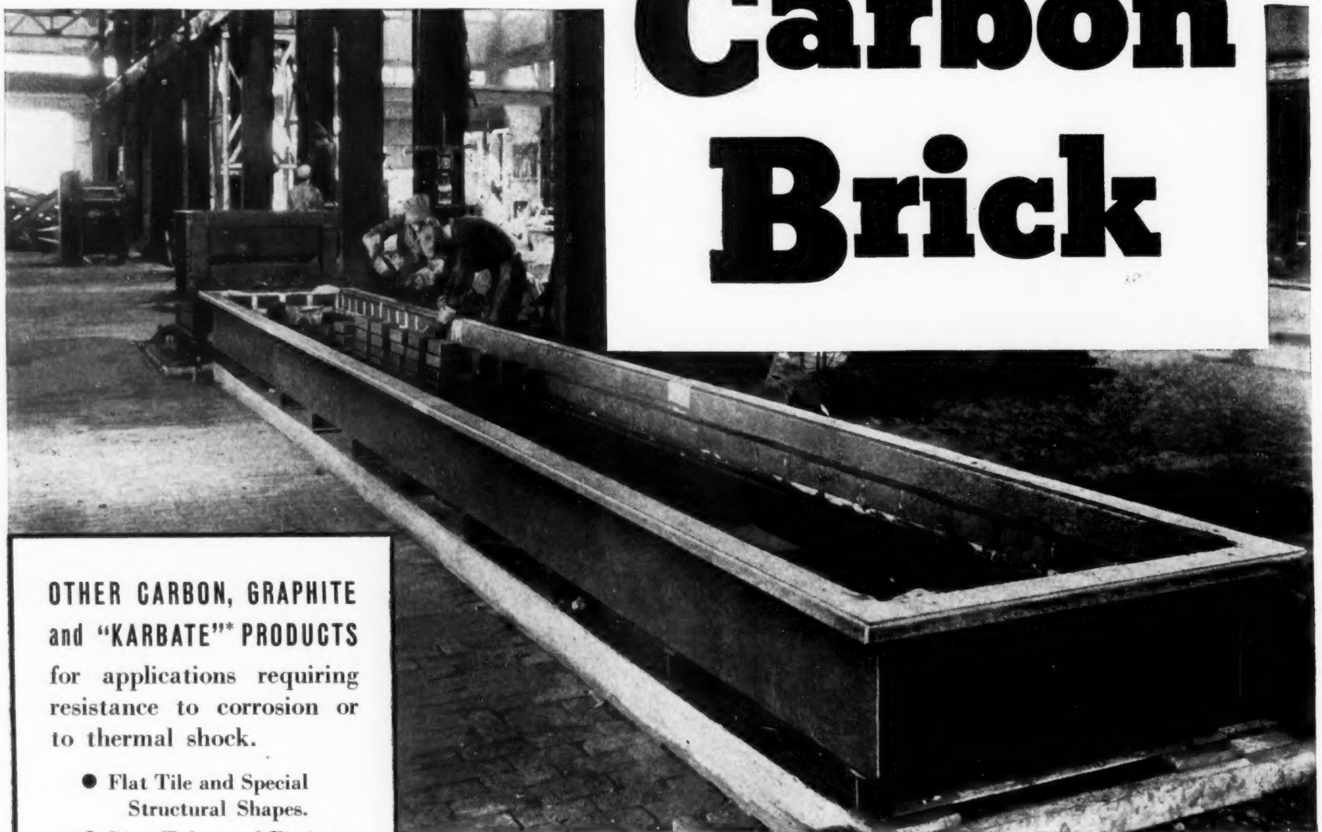
LINE *YOUR* PICKLING TANKS WITH

"National" Carbon Brick is being used successfully for lining pickling tanks. Even where the mixture contains nitric and hydrofluoric acids, carbon brick has proved immune to destructive corrosion.

NATIONAL
TRADE-MARK
Carbon Brick



OTHER CARBON, GRAPHITE and "KARBATE"* PRODUCTS

for applications requiring resistance to corrosion or to thermal shock.

- Flat Tile and Special Structural Shapes.
- Pipe, Tubes and Fittings.
- Heat Exchangers.
- Raschig Rings.
- Flue Gas Scrubber Plates.

*A carbon or graphite base, corrosion resistant material, impervious to the seepage of fluids under pressure. Developed and sold by National Carbon Company, Inc. under its trade-mark "Karbate."

WRITE FOR A COPY OF THE NEW BULLETIN ON CARBON AND GRAPHITE BRICK

"National" Carbon and Graphite Brick have been found highly satisfactory for many types of masonry construction requiring a material that is resistant to corrosion or to severe thermal shock. Carbon and graphite are exceptionally resistant to most of the liquids and gases encountered in chemical processes. They resist the corrosive action of all acids, alkalies and salt solutions except those of highly oxidizing character.

"National" Carbon Brick is mechanically strong, adheres firmly to bonding materials, is not subject to growth and is highly resistant to thermal shock. Graphite brick is recommended in preference to carbon when high thermal conductivity is required.

CUT DOWN LOSSES FROM CORROSION OR THERMAL SHOCK BY USING CARBON OR GRAPHITE BRICK ON CONSTRUCTION EXPOSED TO THESE DESTRUCTIVE FORCES

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide UCC and Carbon Corporation
Carbon Sales Division, Cleveland, Ohio
GENERAL OFFICES
30 East 42nd Street, New York, N. Y.
BRANCH SALES OFFICES
New York, Pittsburgh, Chicago, San Francisco

BUSINESS LEADERS OFFER PROGRAM

"Forward with the Republic"—Theme of Congress of American Industry, Sponsored by the National Association of Manufacturers—Speakers Ask for Sound Governmental Policies, a Balanced Budget, the Maintenance of the Profit Motive, Individual Initiative and Free Enterprise—

MORE than 3,000 leaders of American industry met early last month (Dec. 6-8) in N. Y. City at the annual Congress of American Industry, sponsored by the National Association of Manufacturers, to hear a number of addresses analyzing the present status of business and predicting future economic trends. The Congress, in session at the Waldorf-Astoria Hotel, was climaxed at a dinner meeting on the evening of Dec. 8, when Senator Wheeler of Montana, and Wendell Willkie, president of Commonwealth & Southern, were the principal speakers.

Throughout all the meetings and discussions, a definite theme—"Forward with the Republic"—was carried. The keynote address, delivered on the opening day by Howard Coonley, N. A. M. president and chairman of the Walworth Co., urged rededication of the nation to the fundamental principles upon which it was founded. Mr. Coonley explained that the meeting was for the comprehensive analysis of our economic system, so that "all may move forward with the Republic."

Approves Industry's Program

On Dec. 7, the Congress approved a declaration, or program, setting forth the rights, purposes, abilities, and responsibilities of American industry in promoting the national welfare. This declaration said, in part: "Industrial management in America is equipped to contribute effectively, in its own sphere, to a constructive solution of the problems the Nation faces. The maximum result will be attained with sound governmental policies and with all elements of the economy—industry, agriculture, labor, distribution, transportation, banking and finance, and the rest—striving to serve the public good. It must be made clear to the public that industry's enlightened self-interest is linked inextricably with the welfare of all of these other elements and with the welfare of the Nation as a whole." Held essential was the maintenance of individual initiative and free enterprise, and the recognition of the social value of the profit motive as a powerful incentive to all productive effort. It was pointed out in the declaration that there exists an economic need for profits in industry—profits sufficient to maintain and expand existing enterprise. Heavy stress was laid upon the vital importance of private savings and investment for providing means for new enterprise, additional employment, and for furnishing more and better goods for a greater number of people.

Speaking before the Congress on Dec. 6, J. Howard Pew, president of Sun Oil Co., Philadelphia, pointed out yet undeveloped possibilities of the use of electricity, metal alloys, plastics, synthetic fabrics, and television, saying that these cannot produce what they should "if government becomes our master rather than our servant." Former U. S. Senator Pepper of Pennsylvania told the Congress that an essential part of the American theory of government is that "everybody should take a hand in it." The "most dangerous weakness" of which business men are guilty, he said, is "cowardice in the expression of their convictions respecting government policies which they do not approve."

O'Mahoney Before DCAT

Senator Joseph C. O'Mahoney, addressing the annual meeting on Dec. 13 of the New York Board of Trade, at the Waldorf-Astoria Hotel, asserted that business and government must co-operate, especially in the present European situation which presents "an ever-present warning to us to get about the task without recrimination and without delay."

He said that "We must find a national rule for national business which will permit big business and little business to exist side by side without further expansion of government control." The Senator, who is chairman of the T. N. E. C., defended the growth of Federal bureaus on the ground that the increase in their number was the result of an outgrowth of big business, requiring new commissions for the supervision of this expansion. He stated that "It is not necessary to destroy big business to protect little business nor is it necessary to clothe the government with authority to direct business—discretionary control of a political agency is contrary to the fundamental principle upon which this republic is founded."

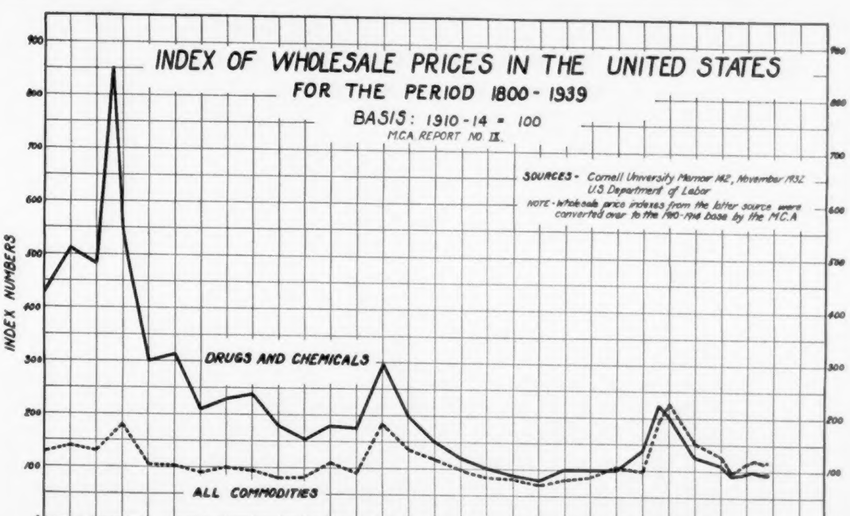
Among the resolutions passed by the members of the Board was included a measure urging that legislation be adopted by Congress enabling all revenue and appropriation committees to act as one body in matters affecting Government revenue and expenditures. Congress was also asked to create a tax commission to give study to a long-term Federal tax program, the commission to report its findings not later than the 1941 session.

Engineering Symposium

More than 200 engineers attended the 6th annual chemical engineering symposium of the A. C. S., which met Dec. 28 and 29 at the University of Michigan, Ann Arbor. The subject, separation of materials in industrial processes, was reviewed through the presentation of papers from college and plant laboratories, touching upon recent experimental developments in sedimentation, froth flotation, and other operations employing the adsorption principle.

Du Pont Offers Fellowships

In the academic year 1940-41, the Du Pont Company will award 6 post-doc-



Wholesale prices in the U. S. by index numbers (1910-14 = 100) for the period 1800 through October 1939. It is interesting to note from the chart prepared by the Manufacturing Chemists' Association, the price peaks attained through financial inflation during periods of national emergency. Subsequent deflation following each emergency resulted in declines below pre-war levels, in most cases. Of special significance is the fact that chemical prices are shown to be lower for each successive peak, whereas the prices for all commodities, on the other hand, are shown to have risen for each succeeding emergency. Chart, courtesy of the M. C. A.

torate fellowships for organic chemical research and 22 post-graduate fellowships for research in general chemistry. The former are for $2000 each, and the post-graduate fellowships are for $750 each. An increase of 2 post-graduate awards is provided for the coming year. The 28 fellowships will be distributed among 20 universities in the United States.

Alliance Elects Officers

The board of directors of the Chemical Alliance, Inc., at a meeting Dec. 12 re-elected the following officers: President, Charles Belknap, Monsanto Chemical Co.; 1st vice-president, Lammot du Pont, E. I. du Pont de Nemours & Co.; 2nd vice-president, Charles S. Munson, U. S. Industrial Alcohol; 3rd vice-president, Willard H. Dow, Dow Chemical Co.; treasurer, J. W. McLaughlin, Carbide & Carbon Chemicals Corp.; secretary, W. N. Watson, 608 Woodward Bldg., Washington, D. C.

The only change made in the executive committee was the election of Louis Ware, International Agricultural Corp., as successor of the late John J. Watson.

Merz Again Heads SOCMA

August Merz, of Calco Chem. Division, American Cyanamid Co., was re-elected president of the Synthetic Organic Chemical Manufacturers' Association last month, at the organization's annual meeting in the N. Y. Chemists' Club. Other S. O. C. M. A. officers elected were E. H. Killheffer, of Du Pont, as first vice-president; F. G. Zinsser, Zinsser & Co., second vice-president; Ralph E. Dorland, Dow Chemical, treasurer; Charles A. Mace, serving again as secretary.

Blakeslee—President-Elect

Dr. Albert F. Blakeslee, Cold Spring Harbor, N. Y., chairman of the genetics department of the Carnegie Institution of Washington, was chosen president-elect of the American Association for the Advancement of Science at the closing session of its convention Dec. 29, in Columbus, O. He will succeed Dr. Walter B. Cannon, Harvard, at the association's meeting next December, in Philadelphia.

To Dr. I. I. Rabi, professor of physics at Columbia, went the association's $1000 prize for his discovery of the atom analyzer, which he described in a paper presented before one of the sessions of the meeting.

Dr. Karl T. Compton, president of M. I. T., and Dr. Roy E. Clausen, University of California, were elected members of the A. A. A. S. executive committee for a 4-year term. Dr. Arthur H. Compton, University of Chicago, and Austin H. Clark, of the National Museum at Washington, were elected members of the council.

Additional "Candid Camera Shots" of booths at the recent Exposition of Chemical Industries, Grand Central Palace, N. Y.

Pa. Chemical Society Meets

The Pennsylvania Chemical Society held its first annual meeting Dec. 15 in Harrisburg, Pa. Speakers on the program included Frank G. Breyer, well-known N. Y. City chemical consultant; Dr. Frank C. Whitmore, dean of the School of Chemistry and Physics, Pennsylvania State College; Dr. Ivor Griffith, dean of the Philadelphia College of Pharmacy & Science; Dr. George D. Beal, Mellon Institute, and Robert T. Baldwin, treasurer of the A. C. S. The society re-elected its president, Dr. Joseph W. E. Harrisson, of the Philadelphia consulting firm, LaWall and Harrisson, and chose Dr. Whitmore as president-elect. Dr. Elliot P. Barrett, Mellon Institute, is secretary-treasurer of the society.

Recorded In Sound

A private showing of the first sound motion picture of a Nobel Prize Winner performing the experiments for which he was awarded that Prize was presented Nov. 13 by the Museum of Science and Industry at Radio City, N. Y. City. This film featured Dr. Irving Langmuir of General Electric Co. Other films are being planned for this series, to include Dr. Urey of Columbia, Dr. Davisson of Bell Telephone Labs., Dr. Arthur Compton of the Univ. of Chicago, and Dr. Millikan of California 'Tech.

Survey Industrial Research

Raymond Stevens, vice-president, Arthur D. Little, Inc., of Cambridge, Mass., has been named director of a nation-wide survey of industrial research, under the guidance of the National Research Council. According to Dr. Ross G. Harrison, Council chairman, the National Resources Planning Board is furnishing the funds for the undertaking to be carried out by the Council. Plans for the survey, to get under way at once, were formulated at a meeting of a special committee last month in the Engineers' Club, N. Y. City. This group will assist in the preparation of a printed report, which will be released early in 1941, presenting an objective study of industrial research as a national resource and as a means of aiding in its further utilization and development.

Cereal Chemists Honor Garnats

Nearly 100 were present at the Dec. 4 luncheon of the Midwest Section, American Association of Cereal Chemists, at the Board of Trade Grill in Chicago. Guest of honor was A. A. C. C. president George F. Garnats, chief of staff, Laboratory Div. of Kroger Research Food Foundation, Cincinnati.

Heavy Chemicals

Year-End Slackening in Demand Reported

Many Chemical Producers Report Best Year in Their History—Very Few Contracts Remain to be Closed—Ammonia, Potash Alums Advanced—Copperas Higher—Tin Declines—

THE year-end brought about the usual slackening in demand for shipment of industrial chemicals, yet the total volume for the month was considerably greater than for the like month of '38. There was a noticeable decline in the feverish activity in spot purchasing. General consensus of opinion is that heavy purchasing and shipping will be resumed shortly and that consumption over the next six months at least will be exceptionally large and will compare most favorably with the corresponding figures of last year. However, manufacturers are well aware that buyers at the outbreak of the European War stocked very heavily. Just how much of this is still in inventories is hard to determine. Most authorities are agreed that inventories are not unusually large.

Few Contracts Unsigned

At the year-end very few contracts remained unsigned. A number of important price advances were announced in the past month. One producer of potassium chlorate announced a 1½c increase in the item. Material has been specially scarce for several weeks. Prices for cobalt acetate and carbonate were advanced as a result of higher raw material costs. The contract price for Caucasian manganese dioxide was raised $5 per ton and spot material was reported to be unavailable.

Delivered prices on sodium hyposulfite and formic acid are now slightly higher in seaboard areas, due to the fact that domestic manufacturers are no longer equalizing on freight rates. The same situation prevailed in sal ammoniac. Contract prices on muriatic, nitric and sulfuric acids were extended into the first quarter unchanged from '39 levels. Domestic sodium silicofluoride is still largely unavailable for spot purchase.

Contract quotations on the following were unchanged for the first three months of '40:—iron free aluminum sulfate; ammonium, potassium and sodium oxalates; calcium sulfide; sodium hydrosulfide, potassium permanganate; sodium chlorate; calcium acetate; calcium carbide; lactic acid; hydrofluoric acid; and oxalic acid.

Export Inquiries Flood Market

Export inquiries continue to flood the market. The total export tonnage, however, has not been quite as large as some of the more optimistic have expected. Prices quoted from this country have in many instances been above those set in the past by Germany and England. Exporters also have experienced difficulty in obtaining certain materials due to the fact that producers have been taking care of domestic consumers and have had to restrict activity in export markets.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Ammonia alum, gran., wks.	$3.50	$3.15
lump, wks.	3.75	3.40
powd., wks.	3.90	3.55
Ammonium linoleate	.12	.11
oleate	.14	.11
stearate, anhyd.	.24½	.22
sulfocyanide	.65	.55
Cobalt acetate	.71	.65
Copperas, bulk	16.00	14.00
Diglycol laurate	.17	.13
stearate	.22	.20
Glycol stearate	.26	.24
Magnesite, calc.	62.00	58.00
Manganese dioxide, Caucasian	66.50	61.50
Potash alum, gran., wks.	3.75	3.40
lump, wks.	4.00	3.65
powd., wks.	4.15	3.80
Potassium chlorate, powd.	.10	.08½
Potassium titanium oxalate	.40	.35
Saltcake, bulk	17.00	15.00
Strontium chloride, tech.	.21	.19
DECLINED		
Sodium fluoride, white	$0.06¾	$0.07
Sodium bisulfite, anhyd.	3.00	3.30
Tin, straits	.53½	.49½
tetrachloride	.24¾	.26¼

New Harshaw Directors

Harshaw Chemical Co., Cleveland, has appointed the following 3 officers to serve as directors of the company: R. H. Geibel, New York sales manager; W. W. Lawson, departmental sales manager; and C. S. Parke, general superintendent of factories.

Exports Up 50%

Chemical and related product exports increased 50% to a total valuation of approximately $25,000,000 in October, as compared with the corresponding month of last year. The increase was general throughout the list—industrial chemicals, chemical specialties, medicinals, pharmaceuticals, coal tar products, naval stores, and paint products recording gains up to as much as 100%.

Outstanding gains were recorded in exports of industrial chemicals, shipments of which increased in value from $2,511,000 in October, '38, to $5,160,000 during this October. Exports of sodium compounds increased in quantity from 50 to 100 million lbs. and industrial gases from 900,000 to 2,373,000 lbs. according to preliminary statistics.

Foreign demand for medicinals continued the upward trend noted in September. Exports of such products during October were recorded at $2,800,000—an increase of more than 60% over the value of such products shipped abroad in October of last year. The demand for American coal tar products, particularly dyes, was also considerable in October when exports of such products reached a total value of $1,798,000 against $891,000 in the corresponding month of last year. Coal tar dyes, colors, etc., shipments of which increased in quantity from 602,600 to 1,371,000 lbs. during these periods, accounted for the bulk of the gain.

Other items and classes on the chemical list recording gains in October included vegetable tanning extracts, exports of which increased in value from $131,600 to $214,300; sulfur, from $1,369,000 to $1,636,000; chemical specialties, from $3,363,600 to $4,290,000; essential oils, from $258,000 to $393,000; paint products, from $1,851,000 to $2,475,000; industrial explosives, from $169,000 to $387,000; and soaps, from $284,000 to $407,000.

Story of Mercury

Mercury is the topic discussed in the January issue of *Priorities*, house organ of Prior Chem. Corp., N. Y. City. The characteristics, production, and uses of this liquid metal are reviewed and some aspects of its future possibilities are mentioned. Attention is given to its indispensability in war and an account is given of the complete monopoly of this commodity once exercised by the Rothschild interests.

Expands Plant Facilities

Resinous Products & Chemical Co., Philadelphia, has let the contract for the building of a $100,000 plant in that city.

CHEMICAL SPECIALTY *News!*

¶ Insecticide and Disinfectant Manufacturers Hold a Highly Successful Silver Anniversary Meeting Dec. 4-5, in Washington, D. C.

More than 200 members and guests attended the silver anniversary meeting of the National Association of Insecticide and Disinfectant Manufacturers, held Dec. 4 and 5 in the Mayflower Hotel, Washington, D. C. At this meeting, the following officers were elected for 1940; President, W. J. Zick, Stanco, Inc., N. Y. City; 1st vice-president, J. N. Curlett, McCormick & Co., Inc., Baltimore; 2nd vice-president, Henry A. Nelson, The Chemical Supply Co., Cleveland; both John Powell, of John Powell & Co., N. Y. City, and Ira P. MacNair, MacNair-Dorland Co., N. Y. City, were reelected treasurer and secretary, respectively. The retiring president, J. L. Brenn, Huntington Laboratories, Inc., Huntington, Ind., retiring president, was elected to the N. A. I. D. M. board of governors for a 3-year term; E. G. Klarmann, Lehn & Fink Prods. Co., Bloomfield, N. J., and Russell H. Young, Davies-Young Soap Co., Dayton, O., were also appointed to the board for 3 years.

Special feature of the Washington convention was a discussion on the "Effect

C. C. CONCANNON

Chemical Division Chief Leads Discussion on "Effects of War on Raw Materials."

of War on Raw Material Markets," led by C. C. Concannon, chief of the Chemical Division, Bureau of Foreign and Domestic Commerce. Among the speakers at this session were S. W. Jacobs, president, Niagara Alkali Co., N. Y. City, who reviewed the potash situation, and J. H. Carpenter, manager of tar acid sales for The Koppers Co., Pittsburgh, who spoke on the export market in cresylic acid. Other talks were given by Lester W. Jones, McCormick & Co. (pyrethrum export markets), Harold Noble, S. B. Penick & Co., N. Y. City (rotenone products experts), J. H. Lawson, Federal Varnish Co., N. Y. City, and by John B. Gordon, Bureau of Raw Materials, Washington, D. C. (coconut oil).

The revision of coal tar and cresylic disinfectant standards was discussed, and a special committee to report upon needed changes in these specifications was appointed, led by Dr. Klarmann. This group will submit its findings to the membership at an early date.

H. C. Fuller, technical consultant to the N. A. I. D. M., reported that an Allergy Reference Index is now available for the exclusive use of association members; one copy of this file is retained at Mr. Fuller's Washington office, and another at N. A. I. D. M. headquarters in N. Y. City.

The association voted to meet June 17-19 at the Spink-Wawasee Hotel, Lake Wawasee, Ind. N. J. Gothard, Sinclair Refining, E. Chicago, Ind., is in charge of arrangements for the mid-year convention.

Soap Committee Reports

A. S. T. M. Committee D-12 on Soaps and Other Detergents submitted a number of important recommendations at its general meeting, Nov. 2 and 3, in N. Y. City. The Subcommittee on Specifications is working out a performance test for the evaluation of soapless detergents such as sulfonated alcohols; it has not yet been thought practicable to set chemical specifications for the various detergents of this type. Proposed standards for tetrasodium pyrophosphate, sodium sesquisilicate, and salt water soap were outlined and will be considered for official action at the Committee D-12 meeting in the Spring. Palm oil soaps, both pure and blended, and low titre soaps were studied in detail, because of their extensive application in the textile field. An effort will be made to determine whether or not a single specification can adequately cover both pure and blended palm oil soaps—it seems that 80% of the solid palm oil soap used in the textile industries is made from palm oil blended with other oils, whereas only 20% of the palm oil chip soap used is blended.

Gives Christmas Bonus

National Oil Products Co., Harrison, N. J., paid last month its 32nd consecutive Christmas bonus to employes in its 8 plants with the distribution of checks ranging from $15 to $50, according to length of service

Specialty Maker's Plant Notebook

By Charles S. Glickman*

A new type of emulsifying agent suitable for the preparation of pine oil disinfectants is now available. The use of this product enables the manufacturer to dispense with heating equipment as the process is operated in the cold. All that is necessary for the preparation of clear and non-separating emulsifiable disinfectants yielding milky solutions when added to water is a mixing kettle or drum of the requisite volume and an agitator. The entire process takes but several minutes and the cost of the finished product closely approximates that for hot processes. No alkali is used or required.

Ceresine, Ozokerite Substitutes

A new series of ceresine and ozokerite substitutes suitable for use in floor waxes, cosmetics, etc., has just been developed. These waxes are available in a variety of melting points and colors ranging from as low as 53° C. (127° F.) to as high as 90° C. (194° F.) and from white to tan in color. These waxes prepared by an exclusive synthetic process are subject to exacting control tests thereby insuring their freedom from variations either in hardness or appearance. Their prices are considerably lower than corresponding natural products. Their solubility in various solvents corresponds to their natural homologues.

New Textile Printing Lacquer

Among the latest developments in textile printing lacquers is a new nitrocellulose base product which produces sharp patterns and designs on various types of fabrics. This new type of product differs from currently available textile printing lacquers in that it shows great adherence to the fabric and is extremely resistant to removal by abrasion or washing.

Information regarding any or all of these products or processes is obtainable upon request by writing to *Chemical Industries.*

* Consulting chemist, 220 Broadway, New York City.

Solvents

Price Advances Outnumber Declines

Approach of Inventory Period Slows Down Volume of Shipments Temporarily—High-Solvency Naphthas Advanced—Steady Tone in Alcohol—Special Formulas Quoted Higher—

ALTHOUGH there was a decided seasonal lull in the shipment of solvents into consuming channels in the weeks just preceding the holiday period, the markets were full of interest for buyers. An unusually large number of price revisions were announced, with advances greatly outnumbering the declines. The strengthening of the solvents' price structure contrasts with the pronounced weakness exhibited in the first nine months of last year and reflects the steady rise in consumption in the coatings industry and other large consuming fields

In the petroleum solvents group the only important price change was an upward revision in the grades of high-solvency naphthas. Nos. 1, 2, and 3 naphthas were advanced 2c per gal. to 18c, 19c, and 20c, respectively, all f.o.b. Bayway, N. J. Nos. 8 and 30 were advanced 1¾c to 16¼c and 16¾c, while No. 40 was advanced 1½c to 16½c, all f.o.b Paulsboro, N. J.

Some uncertainty existed in quotations on methyl acetone when a few producers again adopted the zone quotation method, while others quoted prices East of the Rockies and West of the Rockies.

On the zone basis tankcar quotations are as follows: Zone 1, 35c per gal; zone 2, 37½c; zone 3, 38½c; zone 4, 39c. Drums, car lots, zone 1, 41c; zone 2, 44c; zone 3, 45c; zone 4, 47c. Drums less car lots, zone 1, 44c; zone 2, 50½c; zone 3, 38c; zone 4, 63½c.

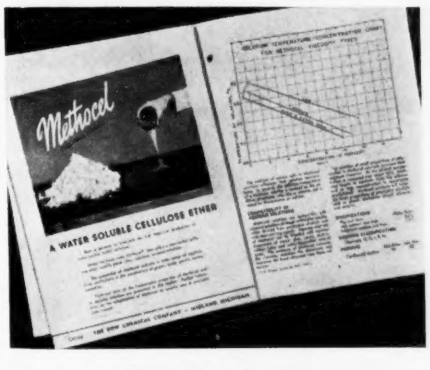
Sales zones: Zone 1, Conn., Del., Dist. of Columbia, Ill., Ind., Iowa, Ky., Me., Md., Mass., Mich., Minn., Mo., N. H., N. J., N. Y., N. C., Ohio, Penn., R. I., Tenn, Vt., Va., W. Va., Wisc. Zone 2, Ala., Ark., Colo., Fla., Ga., Kan., La., Miss., Neb., N. D., Okla., S. C., S. D., Tex, Wyo. Zone 3, Los Angeles, San Francisco, Seattle, Wash., Portland, Ore. Zone 4, Ariz., Cal., Mont., Nev., N. Mex., Ore., Utah, Idaho, Wash.

On the East of the Rockies basis, tankcars are 35c, drums, carlots, 41c. Prices on the Pacific Coast are 3c higher for tankcars and 4c for drums.

Steady price conditions prevail in alcohol. A few upward price revisions were announced in specially denatured, the result of higher costs for denaturants. S. D. 1 was advanced 1c; S. D. 23G was advanced ½c; and special solvent was increased 1c per gal.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Alcohol, butyl, normal, tks.	$0.08	$0.07
drs.	.09	.08
Alcohol, butyl, sec., tks.	.06½	.05½
drs.	.07½	.06½
Alcohol, diacetate, tech., tks.	.09½	.07½
Butyl acetate, normal, tks.	.08	.07
Butyl acetate, sec. tks.	.06½	.05½
drs.	.07½	.06½
Butyl lactate, drs.	.23½	.22½
Butyl stearate, drs.	.28½	.26½
Ethylene dichloride, drs.	.0595	.0545
Ethyl acetate, 85-90%, tks.	.065	.061
drs.	.075	.071
95-98% tks.	.0675	.0635
drs.	.0775	.0735
Methylethyl ketone, tks	.05½	.05
drs.	.06½	.06
Naphtha, high-solvency		
No. 1	18	.16
No. 2	.19	.17
No. 3	.20	.18
No. 8	.16¼	.14½
No. 30	.16¾	.15
No. 40	.16½	.15
DECLINED		
Diethanolamine, tks.	$0.22½	$0.23
drs.	.23½	.24
Diethylene glycol, drs.	.14½	.16
Diethylene glycol monoethylether, tks.	.13½	.15
drs.	.14½	.16
Ethylene glycol, tks.	.13½	.15
drs.	.14½	.16
Ethylene glycol monobutylether, tks.	.15½	.17
drs.	.16½	.18
Ethylene glycol monoethylether acetate, tks.	.10½	.12
Ethylene glycol monoethylether, tks.	.14½	.16
drs.	.15½	.17
Isopropyl acetate, tks.	.05½	.06
drs.	.06½	.07



New Dow Booklet

From Methocel, a water soluble cellulose ether, a superior film-forming material is produced. Coatings manufactured from this material are colorless, odorless, tasteless, transparent and stable to heat and light. The properties of this interesting material seem to forecast unusual possibilities as an agent for dispersing, thickening, emulsifying, sizing and coating. Its applications to paper coating and sizing—to textile, cosmetic and paint fields as a thickening agent—its utility in preparation of pastes, sizes, water colors and paints—for thickening aqueous dispersions of casein and rubber latex—and as a medium for grinding and dispersing pigments, fillers and other paint materials—are all treated at length in a leaflet prepared by The Dow Chemical Company, Midland, Mich. Interested parties may secure a copy by addressing request to Dow and mentioning the name of this publication.

Sun Oil's New Unit

Sun Oil Co., Philadelphia, will construct a new refining unit at its Marcus Hook (Pa.) plant, in addition to other extensive building of additional production facilities there. These plans, to be carried out in the near future, entail an expenditure of $6,800,000 and insure continued employment for the several thousand men now engaged in production and construction at Marcus Hook.

Personnel

Frank E. Nabers, Jr., has resigned from his post as sales manager of the Protein Division, The Glidden Co., Chicago, to become general manager of Gager Lime Co., Sherwood, Tenn. The Gager company is an important supplier of lime to chemical plants and kraft paper mills in the South.

R. W. McKee is manager of the Birmingham, Ala., office of Hercules Powder Co. He is well known in the explosives field of the South, and has been with Hercules since 1922 as salesman and technical representative.

Audenried Whittemore, executive vice-president of Certain-Teed Prods. Corp., Chicago, has resigned from that post after nearly 30 years with the Certain-Teed organization and its predecessor, the General Roofing Mfg. Co.

W. S. Wolfe, formerly manager of Goodyear Tire and Rubber Co.'s development department, is now in charge of all Goodyear factories in the United States. R. P. Dinsmore, formerly assistant to the factory manager, is managing both the development and research departments.

Fred K. McCarthy is manager of National Lead Co.'s Cincinnati office, succeeding the late William A. Dail. Mr. McCarthy joined National Lead in 1935 as sales promotion manager, and became assistant manager at Cincinnati in 1938.

F. George Trescher has been named manager of Hercules Powder's San Francisco office, where he was serving as acting manager. He has been identified with the explosives engineering field for many years and has been with Hercules Powder on the west coast since 1925.

Frederick S. Bacon, formerly with Gustavus J. Esselen, Inc., Boston, has opened a general consultation laboratory in Watertown, Mass. He will specialize in plastics, adhesives, organic research, and sales development.

C. W. Barnes has joined the W. W. Sly Manufacturing Co., Cleveland, O., manufacturer of dust control systems and blast cleaning equipment, in charge of sales promotion and advertising.

George W. Low, Jr., has accepted the position of assistant to the chief chemist at American Viscose's Front Royal (Va.) plant. Previously, he was instructor in chemistry at Amherst.

E. R. Clinton is manager of sales for Whiz motor rhythm division of R. M. Hollingshead Corp., Camden, N. J.

Fine Chemicals

Spectacular Advance in Quicksilver

Camphor (Natural) Quoted Higher—Cold Weather Increases Shipments of Seasonal Items—Citric Firm—Tartars Strong—Actual Export Volume Below Earlier Estimates—

Among those present at the recent Chemical Show were, from top to bottom, William F. Hoffman, Carpenter Container; Dr. Gilbert Thiessen, Koppers; William W. Buffum, treasurer, Chemical Foundation; E. K. Newton, plant engineer, Hooker Electrochemical; James Roche, Koppers.

ASIDE from the spectacular rise in quicksilver the past month in the markets for fine chemicals, pharmaceuticals, aromatics and essential oils was pricewise a very quiet one, especially when comparison is made with the conditions prevailing during the fall months.

Sudden advent of cold snaps in many parts of the country helped to speed the delivery of seasonal items. Export inquiries remain heavy. So far the volume of fine chemicals, etc., shipped into export has been below earlier expectations. This condition is expected to change shortly when consumers in Latin America begin to run short of materials formerly supplied by Germany and England. To date buyers in these countries have hesitated to place actual orders hoping that lower quotations could be obtained. Shortly to be faced with no other alternative, they are expected to replace rapidly diminishing inventories in the next 60 days.

While the market for foreign quicksilver spurted spectacularly in the last 30 days and domestic producers immediately followed suit, the volume of actual transactions was not very great and buyers soon adopted a waiting attitude. At the month-end no change had been made in the price structure on the mercurials.

Natural camphor quotations were advanced sharply, the gain in slabs and powder being 7c, and the new level 77c. The market for tablets was largely nominal. Silver nitrate quotations were slightly higher at the month-end.

Citric and citrates were quiet and unchanged in price; trading in the tartars

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Camphor, nat., slabs	$0.77	$0.65
powder	.77	.65
tablets	.85	.63
Quicksilver	145.00	133.00
Silver Nitrate	.27 1/4	.27
DECLINED		
None		

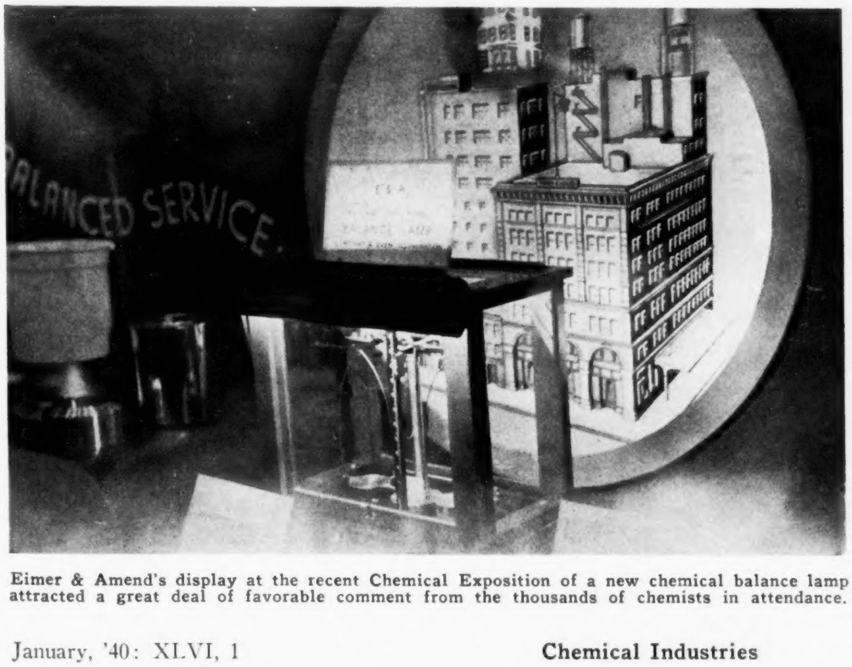
was about normal for this period; bromides were exceptionally firm. Less competition was reported in bismuth metal and its salts. Shipments of alcohol were in excellent volume and the price structure was firm. A strong undertone was in evidence in agar.

Heyden Gives Bonus

Following a custom now 40 years old, Heyden Chemical Corp., N. Y. City, distributed its annual Christmas bonus to employees just before the holidays last month. Bonus averaged 10 days' pay for each employee in Heyden plants at Garfield and Perth Amboy, N. J.

Nopco Promotes Post

Dr. Charles I. Post, formerly manager of the Vitex and special markets division of National Oil Products Co., Harrison, N. J., has just been appointed general manager of all Nopco vitamin sales. Edwin S. Rebholz and Samuel S. Carlat, formerly sales managers of the Vitex and special markets divisions, respectively, will become managers of their divisions, and will retain as well their present duties as sales managers.



Eimer & Amend's display at the recent Chemical Exposition of a new chemical balance lamp attracted a great deal of favorable comment from the thousands of chemists in attendance.

Coal-Tar Chemicals

Domestic Cresylic Advanced Sharply

Tar Acid Oils Raised 1c—Cresol, U.S.P., Now at 9¾c—Most Coal-Tar Chemicals Quoted for First Quarter of '40 Unchanged—Good Demand for Intermediates and Dyes—

ACTIVITY in the coal-tar chemical field last month centered largely in the renewal of contracts. By far and large the overwhelming majority of products were quoted for the first quarter of '40 at prices unchanged from existing levels. The outstanding exceptions were in cresylic, solvent naphtha, tar acid oils, and 5 degree and 3 degree xylol. One domestic maker of cresylic advanced quotations on both high boiling and low boiling material 10c. A ½c increase was announced in the resin grade of cresol, and U. S. P. material was advanced ¼c to the basis of 9¾c. Both grades of tar acid oils were "upped" 1c, the new quotations being 22c and 26c in drums respectively. The l.c.l. price structure of shingle stain oil was lowered 1c, to the basis of 20c per gal., but no change was made in the tank-car or carlot drum quotations.

Leading coal-tar solvents remain unchanged in the first quarter. The scarcity of certain of these was relieved somewhat in the last 30 days. Benzol was in slightly better supply.

Shipments of coal-tar chemicals declined seasonally in the last two weeks of '39. Export business showed no signs of declining, but producers in certain items were unable to make prompt deliveries for foreign destination. Higher prices for export prevailed in many products.

Intermediates continued in good demand. Producers of dyes generally renewed contracts for the first quarter of '40 at existing levels.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Acid cresylic	$0.68	.$0.58
Cresol, resin grade	.08¾	.08¼
U. S. P.	.09¾	.09½
Naphtha, solvent, drs.	.32	.31
tks.	.27	.26
Tar acid oils, 15%	.22	.21
25%	.26	.25
Xylol, 5°, drs.	.42	.37
tks.	.40	.32
3° drs.	.47	.42
tks.	.45	.37
DECLINED		
Shingle stain oil, lcl.	$0.20	$0.21

New Plant in Production

U. S. Steel's new coal tar base plant at Clairton, Pa., is now in production. It is to have an annual capacity of 5 million lbs. of such bases as 2-degree pyridine, picoline, and piperidine, and will supplement the Corporation's by-product output of heavy coal tar chemicals (benzol, tar, etc.) from its mammoth gas and coke works at Clairton.

Obituaries

J. Harvey Gravell, 63, president of American Chemical Paint Co., Ambler, Pa., died Dec. 8 at his home in Ambler. Founder of the company, in 1936 he began the practice of giving liberal Christmas bonuses to his employes and, in the last 3 years, had distributed more than $200,000. He was a trustee of the Academy of Natural Science, and a member of the A. C. S. and of the Franklin Institute in Philadelphia. Mrs. Gravell died in 1938. A brother, Thomas, survives.

Dr. Joseph F. X. Harold

Dr. Joseph F. X. Harold, 65, industrial chemist and textile consultant, died Jan. 3 in N. Y. City.

Born in Philadelphia, he received his Ph.D. from the Univ. of Pennsylvania and, for the last 28 years, was consultant to the William Grosvenor Laboratories at 50 E. 41 st., N. Y. City. In 1920, Dr. Harold was in Paris as a technical adviser to the Reparations Commission and the Department of State. He was a member of the A. A. T. C. C. and, for the last 10 years, had been on the association's Research Committee and, from 1934 to 1936, a councilor-at-large. He was also a member of the A. C. S. and of other professional societies, and of the Chemists' Club (N. Y.).

Hugh Kelsea Moore

Hugh Kelsea Moore, 67, died Dec. 18 in Dunedin, Fla. He was a past president of the A.I.Ch.E. and the recipient in 1925 of the Perkin Medal, presented in recognition of his many important contributions to chemical engineering.

A graduate of M. I. T., Dr. Moore entered the employ of the Electro-Chemical Co., Rumford Falls, Me., in 1897, and later was associated with the Moore Electro-Chemical Co. and American Electro-Chemical Co. until 1903. From that year until 1934, when he retired, he was chief chemist of the Burgess Sulfite Fiber Co., now the Brown Company, of Berlin, N. H.

Frank Ludlam

Frank Ludlam, assistant secretary and assistant treasurer, International Nickel Co., Inc., died Dec. 8 at his home in N. Y. City, after a long illness.

Mr. Ludlam was born at Bloomfield, N. J., on Nov. 3, 1873. He attended the Lyons School in N. Y. City and Columbia School of Mines, where he studied architecture. After spending several years in architecture and real estate, Mr. Ludlam took a position with Carnegie Steel in Pittsburgh. In March, 1903, he came to the International Nickel Company.

He was a member of the Columbia University Club and the Kane Lodge F. and A. M. Surviving are 2 sons, George P. and Kennedy R., of N. Y. City. Mr. Ludlam's wife, the former Amy Roberts, died in 1938.

Joseph P. Heilbronn

Joseph P. Heilbronn, president of the Philippine American Drug Co., wholesale drug and chemical house, Manila, P. I., died Monday, Dec. 4, at Dante Hospital, San Francisco, after an illness of 6 months.

Mr. Heilbronn was a member of the first California Volunteers who left San Francisco in May, 1898, captured Guam, arrived in the Philippines on June 30 and took part in the occupation of Manila on Aug. 13. He fought through the Philippine Insurrection and returned to be mustered out with his regiment in September, 1899.

He was a pioneer in every sense of the word and took an active part in the life of Manila, and was also widely known in the United States.

He was born in Wiesbaden March 13, 1868, and came to New York as a youth.

Thomas Armstrong

Thomas Armstrong, 73, assistant manager, Phosphate Products Div. of Virginia-Carolina Chem. Corp., Richmond, Va., died Dec. 24 at his Richmond home. A native of Stamford, Conn., he had been a resident of Richmond for more than a half-century, and had been with Virginia-Carolina for many years.

Other Deaths of the Month

Alexander J. Genz, 67, assistant superintendent and chief engineer of the Borne Scrymser Co.'s refinery in Elizabeth, N. J., on Dec. 6.

Benjamin S. Buckmaster, sales manager, Pfanstiehl Chemical Co., Waukegan, Ill., on Dec. 24.

Emile L. Rimbault, 47, sales manager, Federated Metals division of American Smelting & Refining, in his home at New Rochelle, N. Y., on Dec. 22. He joined A. S. & R. in 1925, having previously been assistant sales manager for National Aniline and Chem. Co.

Joseph J. Fass, for 15 years head chemist for Industrial Rayon Co., on Dec. 27, in Buffalo, N. Y.

Mrs. Ambolena M. J. Hooker, widow of Albert H. Hooker, who had been technical director of Hooker Electrochem. Co., Niagara Falls, on Dec. 25, in Lewiston, N. Y.

In every field of endeavor recognized quality standards are eventually set up, which are accepted by manufacturers as something to aim at. By replacing older purification methods, NUCHAR Activated Carbon economically removes objectionable color, odor and taste which adversely affect the achievement and maintenance of highest quality standards. NUCHAR Activated Carbon is already recognized in the Chemical Field as the Modern Purifier, since it actually REMOVES impurities from solution instead of changing their chemical composition.

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Raw Materials

Shellac Prices Move Sharply Higher

Chinawood at Higher Levels—Some Grades of Carnauba Unobtainable—Several Important Natural Tanstuffs and Dyestuffs Advanced in Price for First Quarter of '40—

WITH the approach of the holiday season trading in most of the natural raw materials slackened considerably. Buyers of oils and fats showed less interest, but despite this condition most of the important oils registered price advances. Little chinawood is available, and what little was offered, was sold at 26½c in drums and 25½c in tanks. Linseed scored heavy price gains on the news that the Argentine flaxseed crop was well below normal. Most of the drying oils were up in sympathy with the advance in chinawood and linseed. Crude and refined soybean oil went higher in the December period when soybean futures were advanced strongly. Corn oil was up for a similar reason.

Carnauba Still Scarce

The unsettled situation in carnauba wax remained unchanged in the period under review. Cables from Brazil were conflicting, some indicating that lower quotations were likely, while others were in just the opposite vein. In the meantime, buyers locally still were experiencing all kinds of difficulties in getting supplies. Bayberry wax declined 2c last month, and Japan eased off ½c, to a basis of 17c.

Shellac prices advanced strongly when buyers evinced interest in fairly large quantities. It is reported that some speculative interest was present in the market. Firm conditions characterized the Calcutta market.

Considerable interest developed in the markets for natural dyestuff and tanning extract materials. Gambier, hematine, and hemlock extracts showed gains. Logwood extract was another item to move into higher price ground, but chestnut, fustic, oakbark, and hypernic were offered for delivery for the first quarter unchanged from existing levels. Sharp declines were registered in Myrobalans, J1 and J2. On the other hand, mangrove bark was raised $10 per ton, and both ground and leaf sumac were advanced when offerings turned scarce.

Egg products were weak and failed to hold the recent gains. The rise in the grain markets forced advances of 5c in dextrin, starch, corn sugar, and corn syrup. Thickboiling wheat starch is now quoted at 5½c, a gain of ¼c per lb.

The advance in castor oil continued last month and forced higher quotations for sulfonated castor. A more settled condition appeared in the markets for other sulfonated oils.

A fairly steady tone was in evidence in the primary turpentine markets during the last 30 days. Buying was light in both "turps" and gum rosin. Most of the rosin grades showed slight price declines when comparison is made with quotations on Nov. 30.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Corn sugar, tanners	$2.99	$2.94
Cutch, Borneo	.04½	.04
Gambier, ext.	.09½	.09
Hematine, cryst.	.20	.18
Hemlock, bark ext. tks.	.03	.02¾
Logwood, ext., cryst.	.20	.18
liq.	.10½	.09½
solid	.16½	.15½
Mangrove bark	35.00	25.00
Oil castor, blown	.14¾	.13¾
Oil chinawood, drs.	.26½	.25
tks.	.25½	.24
Oil coconut, crude, tks.	.03⅝	.03½
Oil, corn, crude, tks.	.06¼	.05½
Oil linseed, raw, tks	.102	.091
Oil menhaden, crude	.34	.32
ref'd alkali, tks.	.073	.069
Oil sardine, crude, tks	.35	.31
ref'd alkali, tks.	.073	.069
Oil soybean, crude, tks.	.06½	.05¼
Shellac, bone dry	.25	.23
Garnet	.19	.16
superfine	.20	.17
T. N.	.19	.16
Starch, wheat, thickboil	.05½	.05¼
Sumac, grd.	83.00	82.00
leaf	85.00	82.00
Wax candelilla	.18½	.18
Wax carnauba, No. 3	.45	.43
N. C. 3	.48	.44
DECLINED		
Albumen, egg., dom.	$0.62	$0.64
Oil lard	.09	.09½
Myrobalans, J1	33.50	42.00
J2	27.50	33.00
Wax bayberry	.28	.35
Wax bees, crude, African	.27	.29
Brazilian	.27	.32
Wax Japan	.17	.17½

Seek Cooperation on Shellac

Hoping to prevent any shellac price increases (as resulted from the last World War) directors of the American Bleached Shellac Manufacturers' Association cabled last month to 2 provincial governments in India (Bengal, and Bihar and Orissa—) the 2 leading shellac-producing states of India—asking for co-operation in protecting the consumer against undue speculation in the Indian shellac market.

So far, shellac shipments are reaching the American market without interruption, and low prices have been a stimulus to shellac sales within recent years, according to the Association. At the present time, as the directors pointed out in their cables, increases in shellac costs would nullify the research and development work that has been carried out here, at great expense, in order to widen the uses of shellac.

A new piece of equipment which attracted much attention at the Grand Central Palace.

Emery Issues Booklet

Emery Industries, Inc., Cincinnati, has just published a handsome booklet on the occasion of its 100th anniversary. Company, one of the largest manufacturers in the U. S. of oleic and stearic acids, and other fatty acid materials, was established in Cincinnati by Thomas Emery, in 1840.

Bluman Now a Consultant

Dr. Ernest H. Bluman has established a consulting office at 216 Montclair ave., Montclair, N. J. He graduated in engineering from Charlottenburg Technische Hochschule in 1920. Since then, he has specialized in the technology of oils and fats, having been for a number of years managing director of Vereinigte Stearinwerke G.m.b.H., Hamburg, Germany. Dr. Bluman has been retained as consultant by A. Gross & Co., Newark, N. J.

Builds 2nd Unit

The Gardner Extract Co., Waynesboro, Va., is building a second unit near Monterey, Va., to increase its capacity for the production of tanning extracts. New plant will approximately double the company's present weekly output of 100,000 lbs. of extracts.

New Fluorspar Producer

The Mercer Fluorspar Mining Co. has been organized in Lexington, Ky., to work an old fluorspar vein in Mercer County, Ky. This mine was last operated in 1923. H. S. Covington, of Lexington, is president of the new firm.

Mantell Leaves Importers

Due to demands on his services in connection with patent litigation, Dr. Charles L. Mantell, consulting chemical engineer of N. Y. City, has severed his connection with the American Gum Importers Association, whom he served as director of research. He is the author of the current Natural Resins Handbook, and has been technical expert in important patent suits involving alkyds, phenolics, maleics, and other resinous materials of wide interest to the paint, varnish, and lacquer industries. He will continue to serve as advisor to the natural resin producers whose work will be carried on separately in another laboratory.

Pigments and Fillers

Palmitates, Stearates Higher for First Quarter

Decline in Trading Volume During Holiday Season—Coatings Makers Expect Best Spring Season in Decade—Casein Prices Weaken—Bone Black Advanced 1c—Pigments Firm—

THE holiday period slowed down business in raw paint materials to a marked degree. Suppliers, however, anticipate that the heavy purchasing of the past three months will be resumed early in January. Coatings makers expect the busiest spring season in 10 years and although inventories in their hands are generally larger than at any time in the past few years this is not expected to delay further buying to any great extent.

Pricewise declines outnumbered advances in the past 30 days. One producer of bone black revised the schedule, the increase amounting to 1c. Makers of driers generally advanced quotations on palmitates and stearates for the first quarter of the new year. Zinc stearate is now 23c; magnesium stearate, 24c; calcium stearate, 20½c and aluminum stearate, 19c. Palmitates were advanced 1½c in each case.

Casein quotations showed further evidence of price weakness. Imports from the Argentine have been quite large for the past several months. One outstanding price change was a 1c decline in chrome yellow. This was directly attributed to keen competition between makers. On the new basis contracts are 13½c and spot lots are 14½c.

The lead, titanium, and zinc pigments were quiet during the period under review and unchanged in price. Carbon black shipments continued heavy last month despite the nearness to the usual inventory period. Higher prices for glue were established in the past month. Suppliers of barytes, tripoli, graphite, and gypsum have renewed prices unchanged from former levels. An unusually larger number of price revisions were made in the solvents group. These are reported in detail in the Solvents Section.

N.P.V. & L.A.'s New Home

The National, Paint, Varnish and Lacquer Association will soon occupy its new national headquarters in Washington, D. C., the former home of the late Levi P. Morton, Vice-President in the Benjamin Harrison administration. The building, at 1500 Rhode Island ave., N. W., was designed by Stanford White and modernized in 1912 by John Russell Pope. The association has had its offices in the past at 2201 New York ave., N. W.

Drogin with United Carbon

Dr. Isaac Drogin, chief chemist for J. M. Huber Co., Inc., since 1922, has been appointed director of research for United Carbon Co., Charleston, W. Va.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Bone black (all grades) 1c		
DECLINED		
Blue milori	$0.33	$0.36
Prussian	.33	.36
Casein, 20-30	.15	.17
80-100	.16½	.17
Chrome yellow	.13½	.14½
Eosin toner	1.25	1.60
Lacquer maroon	1.25	1.65
Lithol toner	.55	.62
Para toner	.70	.75

Krumbhaar Forms Company

Krumbhaar Chemicals, Inc., has been organized to manufacture synthetic resins and oils of a new type, under the direction of Dr. William Krumbhaar, formerly vice-president of Reichhold Chemicals, Inc., of Detroit. Dr. Krumbhaar is president of the new organization, which is building a plant in South Kearny, N. J.

Chase Plans Return

W. S. Chase is planning to re-establish his former chemical drier business in association with the Schaffer-Moss Chem. Corp. of Pittsburgh. He resigned his position with the Harshaw Chemical Co., Cleveland.

Pfeifer with Paramet

H. A. Pfeifer has joined Paramet Chemical Corp., L. I. City, N. Y., and will serve with company's Technical Service Division. He has been active in the resins and oils trade, in various capacities, for the past 20 years.

Agricultural Chemicals

Mixers Fail to Accumulate Raw Materials

Bone Products Firmer—Stocks of Sulfate of Ammonia Available—Industry Expects Good Season—Chipman Resigns Presidency, Chipman Chemical—Bernuth New Head—

THE holiday season just passed was responsible for a decided let-down in trading activities in the markets for raw fertilizer materials. Buyers appeared anxious not to accumulate further inventories at the year-end.

The price structure of raw materials held remarkably steady in the period under review. The contracted price for urea-nitrogen was advanced 50c per ton at the year-end, making 42% material $57.40; 40%, $56.25; and 30% $42.55. The contracted price of sulfate of ammonia was advanced at the same time to $28 per ton. The tight situation in spot stocks of this item appeared to be somewhat relieved. The $28 price now holds on contract deliveries until June.

Bone materials were firmer in the last 30 days. A slight let-up in the buying of superphosphate was noted, but this trend is believed to be only temporary. Generally speaking, the natural ammoniates were quiet, but prices were firm and unchanged.

With farm income up mixers are optimistic over the outlook for this season. However, they are proceeding cautiously and much depends in the first few months on what type of weather prevails in the far South.

Important Price Changes

	Dec. 31	Nov. 30
ADVANCED		
Ammonium sulfate	$28.00	$27.75
Bone, raw, 4½ and 50, Chgo.	32.00	31.00
Bone meal, 3 & 50, Chgo.	31.00	30.00
Urea-Nitrogen, 42%	57.40	56.90
40%	56.25	55.75
30%	42.55	42.05
DECLINED		
None		

Chipman Resigns Presidency

Ralph N. Chipman has resigned from the presidency of Chipman Chem. Co., Bound Brook, N. J., which he founded 23 years ago to specialize in the marketing of sodium chlorate for weed extermination. Although he has relinquished his interests in the company, he will continue to be active in the chemical field. Mr. Chipman is a member of the executive committee of the M. C. A., and chairman of the board of the Agricultural Insecticide and Fungicide Association.

Bernuth Heads Company

Chipman Chemical Co., now a subsidiary of Bernuth, Lembcke Co., announces the election of the following officers: President, Oscar M. Bernuth; assistant to the president, Charles M. Bernuth; vice-president and treasurer, Warren H. Moyer; vice-president, Byron P. Webster; assistant treasurer, William R. Evans; assistant secretary, Cornelius A. McAloon.

Chipman Chemical is a large producer of a wide line of agricultural insecticides, fungicides, etc. The company also recently announced the purchase of Berako Company, manufacturer of rotenone products.

Correction: Equipment shown on page 571, November issue, and credited to The La Bour Company, should have been credited to New England Tank & Tower.

Prepared Monthly by U. S. Industrial Chemicals, Inc.

SOLVENT NEWS

Reg. U. S. Pat. Off.

January ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1940

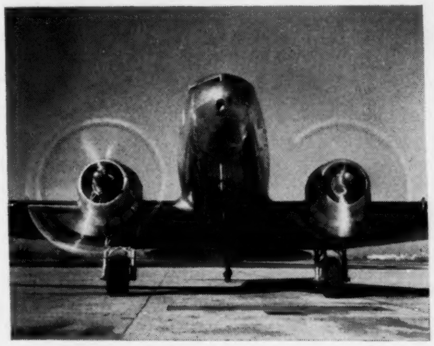
Solox Widely Used For Plane Propeller Anti-Icing Fluids

Mixed With Glycerine to Avert Dangerous Flight Conditions

Rapid growth of airplane transportation is expected to result in an increased demand for Solox, U.S.I.'s alcohol-type solvent, which is reported to find extensive use in propeller anti-icing mixtures.

All planes operating in commercial transport service are equipped with a device for supplying a de-icing mixture to a slinger ring at the propeller hub. From this point the mixture is further spread over the propeller surface by centrifugal force, preventing ice formations on the propeller which might result in dangerous flight conditions.

A suitable mixture for the purpose is said to consist of 85 parts of Solox and 15 parts of C. P. Glycerine. The average plane carries 10 gallons of de-icing solution on regular flights—more than enough for a trip from New York to Chicago under ordinary conditions.



WINTER FLYING. A mixture of Solox and glycerine, supplied to airplane propellers, aids in preventing ice formations.

Finds Way of Making Foam For Extinguishing Fires

FRANKFORT-ON-THE-MAIN, Germany—A new process of producing fire-extinguishing foam is revealed in a U.S. patent granted jointly to inventors here and at Bad Soden.

The foam, it is claimed, is prepared from a gas, a large quantity of water, and a relatively small amount of a concentrated aqueous solution of an organic foam-forming agent. In addition, the solution contains a hydrophilic organic solvent, such as alcohol, glycol, or ethyl acetate, which, the inventors say, facilitates the dissolving of the foaming agent in the water.

Alcohol and Ethyl Acetate are U.S.I. Products.

Alcohol Proves Helpful In Bleaching of Wood

BUFFALO, N. Y.—That alcohol can be used to facilitate the bleaching of wood has been revealed in a patent granted to an inventor here.

The alcohol, according to the patent, is used in connection with a peroxide and an alkali. The alcohol is allowed to evaporate from the wood, and thus increases the concentration of the bleaching agent.

Treatment With Curbay X Aids Efficiency of Coal Combustion

U.S.I. Product Valuable Medium Promoting Quick Ignition and Free Burning; Overcomes Caking and Air Slaking

Curbay X powder, specialty product manufactured exclusively by U.S.I., has definitely established its value as a medium for treating coal to increase the efficiency of combustion, Mr. F. A. Schleindl, coal conditioning specialist, told SOLVENT NEWS.

"Coal should be considered a raw material and not a finished product. In order to attain its maximum usefulness, it must be processed like any other raw material to suit the specific job it is to do. In this processing, Curbay X has proved itself a valuable and versatile assisting medium.

"This conclusion was reached after extensive laboratory research over several years here and abroad, followed by large-scale commercial applications on every type of hand- and stoker-fired equipment, involving hundreds of thousands of tons of coal from practically every mining field.

Many Advantages Indicated

"From this broad experience with Curbay X for coal conditioning, the following advantages in attaining fuel economy are noted:

"1. It reduces caking, with its concomitant disadvantage of high stack losses, caused by the excess air needed for combustion.

"2. It minimizes air-slaking.

"3. Substandard or low grade coals with inferior burning characteristics can often, through Curbay X treatment, be brought up to standard performance with obvious money savings.

"4. It reduces soot deposits and smoke.

"5. Curbay X under proper formulation with certain additions, serves to raise or depress the fusion point of the ash, as desired, resulting in a neutral ash and clinkers easy to remove.

"6. It aids in preventing spontaneous combustion.

Wide Usefulness Foreseen

"A particularly striking feature of Curbay X is the readiness with which it can be adapted to the processing of different types of coal. It is, of course, a recognized fact that

(Continued on next page)

Here is U.S.I.'s new 1-gallon Solox can, designed for easy storing and quick sales in retail outlets. Its attractive colors make it particularly adaptable to display purposes, and rectangular shape helps save valuable shelf space. The can is provided with a convenient carrying handle, and is equipped with a closure of the popular "U-Press-It" type.

Higher Alcohols Used to Extract Pure Cellulose

ST. PAUL, Minn.—How alcohol can be used to obtain relatively pure cellulose from wood is revealed in a patent granted to an inventor here.

Process is reported to consist in treating the wood with a water solution of a monohydroxy alcohol. The alcohol, it is said, should have at least four carbon atoms, and at least three of them in a straight chain; should be substantially insoluble in water at normal temperatures, but soluble at temperatures between 100° and 200° C. In addition to the alcohol, an inorganic alkali is used in amounts ranging from 2 to 10%.

The process, it is said, serves to dissolve in the water practically all of the non-cellulosic constituents of the wood, allowing the cellulosic constituents to be separated out after a cooling process.

Curbay X, reported to have shown excellent results in coal conditioning. Desirable point of application is the chute between breaker and gondolas, as shown in large photograph. Insert shows plant of Pittsburg and Midway Coal Mining Co., where treatment with Curbay X is a feature of coal processing.

January ★ SOLVENT NEWS ★ 1940

Soybean Oil Paints Show Up Well in Exposure Tests

WASHINGTON, D. C.—Paints and varnishes made with soybean oil compare satisfactorily with those made from tung, perilla, and linseed oils when subjected to exposure tests, it is indicated by reports received at the Department of Agriculture here from the Government soybean laboratory at Urbana, Ill.

While it is recognized that the soybean paints harden and dry a little more slowly than other types, the tests indicated that this factor did not have a harmful effect on the durability of the paint, it is said.

White exterior paints made from commonly used pigments with soybean oil appeared to be in good condition after two years' exposure on outside fences, it is stated. Cheaper varnishes made with soybean oil are believed to offer interesting possibilities.

Discusses Production And Uses of Industrial Alcohol

BALTIMORE, Md.—L. A. Helfrich, Production Manager of U.S.I.'s plant here, delivered an address on Production and Uses of Industrial Alcohol before the Baltimore branch of the American Pharmaceutical Association on Thursday, December 14, in the School of Pharmacy Building, University of Maryland.

Curbay X Conditions Coal

(*Continued from previous page*)

coals vary widely in their chemical composition, and processing for fuel economy must take into account both the chemical composition of the coal and the nature of the application. By varying the proportions of Curbay X and using it either alone or in combination with other materials, it is possible to condition a wide variety of coals for specific applications.

Action Considered Catalytic

"Mixed with water, and with or without other chemical additions, Curbay X is applied to the coal in the form of a spray. Only a trifling amount per ton is needed with corresponding low cost.

"The action of Curbay X in increasing the efficiency of fuel combustion is both mechanical and catalytic. That the action is catalytic rather than chemical is indicated by the relatively small amount of Curbay X required in the conditioning process. In fact, this application of Curbay X may be regarded as an extension of catalytic chemistry into the coal combustion field.

"It is the custom to buy coal on a B.T.U. basis, rather than on a basis of *recoverable* heat—the factor in which the user should be primarily interested. Coal conditioning, properly applied, may serve to bring about a reconsideration of such purchasing policy. Curbay X is not, of course, to be regarded as a panacea for all coal troubles and its use should be recommended only after a study of specific conditions."

U.S.I. invites both producers and users of coal who wish further information from Mr. Schleindl on coal conditioning with Curbay X to write to SOLVENT NEWS.

Prints Artificial Films And Foils with New Ink

LONDON, England—A printing ink said to be suitable for artificial foils, films, and similar products is described in a U. S. patent issued to an inventor here.

The ink is reported to consist of a pigment, an organic derivative of cellulose, such as cellulose acetate, and a plasticizer, used in a proportion at least five times as great as the total weight of the plasticizable material, suitably with the use of carbon black, iron oxide, benzyl alcohol, acetone, benzene, and alcohol.

Acetone and Alcohol are U.S.I. products.

U.S.I.'s Fairfield Plant Wins Safety Merit Award

Mr. F. C. Hettinger, Superintendent of U.S.I.'s Fairfield Plant, recently received, as representative of the plant employees, a certificate of merit awarded by the company's insurance carrier for the non-accident record established by the plant.

The record was established during the period from January 19 to August 6. During this time the plant operated for a total of 364,315 man-hours without a disabling injury.

Packs Food with Solid CO_2

NEW YORK, N. Y.—A package that is said to preserve the flavor of foodstuffs, such as coffee, sauerkraut, etc., has been patented by an inventor here. Package is made with an inner container, in which is inserted a pellet of solid carbon dioxide ("Dry-Ice"*). Outer container, says the inventor, is capable of supporting the walls of the inner flexible container when pressure is exerted by the vaporization of the pellet.

*Manufactured and supplied by Pure Carbonic, Incorporated, an associated Company of U.S.I.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A new industrial finish is said to have exceptional low-temperature speed baking characteristics. Curing temperatures are reported to be the lowest ever obtained for a speed-baking finish with similar properties of adhesion, flexibility, color retention, and toughness. The manufacturer claims that it can be used in conventional ovens. **(No. 290)**

U S I

A latex preservative is said to be non-volatile at ordinary temperatures, odorless, effective, and permanent. According to the manufacturer, it is toxic to algae, bacteria, protozoa, fungi, and other micro-organisms, while it is no more harmful to human beings than many other chemicals in common use. **(No. 291)**

U S I

A soap anti-oxidant is reported to be effective in minute quantities in restraining the oxidation and resulting rancidity, discoloration, and other adverse qualities of soap. It is said to be equally effective in soaps produced from animal or vegetable oils, filled or unfilled. **(No. 292)**

U S I

A protective coating is said to be suitable for wood or metal exposed to liquid acids or caustics. The manufacturer recommends it for lining tanks containing the usual commercial acids or caustics, or for protecting machinery from the spillage of these products. **(No. 293)**

U S I

A pH tester is described as a handy means of making approximate pH measurements. It is said to be a device for holding and dispensing pH paper in convenient form. According to the manufacturer, any desired length of paper can be drawn from the container, while at the same time the paper is protected from contamination by the atmosphere. **(No. 294)**

U S I

An adhesive cement has been released for sale on a restricted basis, it has been announced. According to the maker, the cement permits making strong, chemically-resistant joints between rubber and metals, and is useful in joining many other materials, such as woods, ceramics, and many synthetic resins. **(No. 295)**

U S I

A new mixer is said to be suitable for mixing viscous materials without incorporating air. The mixer is further reported to be silent and free from vibration. **(No. 296)**

U S I

White chromium plating is reported to be possible with a new chemical for converting ordinary chromium solutions into white chromium solutions. The process is said to produce a plate free from bluish tints, and to effect savings in plating time. **(No. 297)**

U S I

An aluminum finish is said to produce a soft patina resembling that of tarnished silver. It is baked on, and is reported to show excellent adhesion and high resistance to mechanical abrasion. **(No. 298)**

U S I

A pulley covering comes in the form of a plastic coating material which can be applied to a flat pulley after cleaning with benzol or carbon tetrachloride, it is reported. **(No. 299)**

Salesmen's Christmas Party

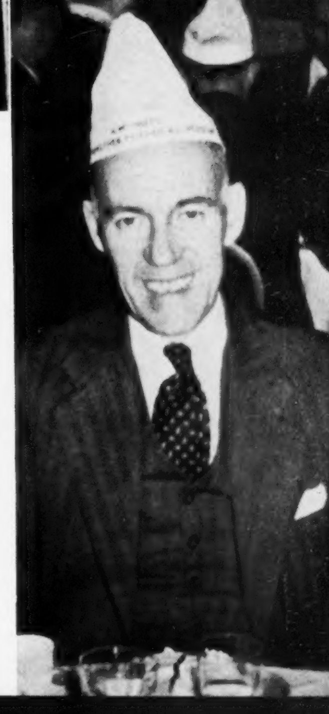
Candid camera shots at 18th Annual Dinner, Salesmen's Association of the American Chemical Industry, Hotel Edison, New York.

Above, right, George Bode, R. & H. Chemicals Division, and Burton T. Bush, first president of the Association. Right, "Bob" Gould, Heyden Chemical's popular P. A.

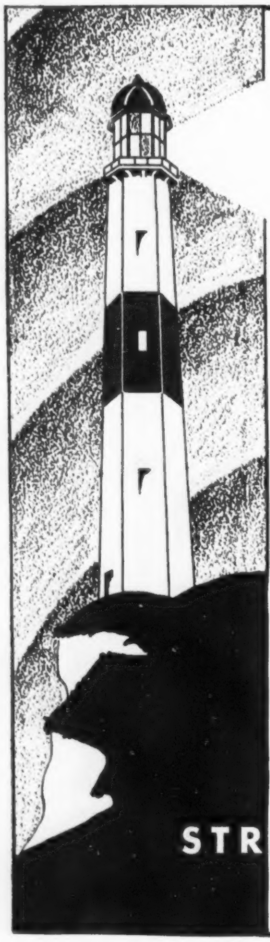
Above, left, Q. T. Dickinson, Calco; right, "Charlie" Hayes, Reilly Tar. Directly to the left, John A. Chew, well-known chemical dealer, who it is rumored, com pletely "cornered" the Berryville, Va., plum pudding market before the holidays.

Left, Fred Koch, Dow Chemical, appears to be enjoying the show; right, W. Newell ("Shorty") Wyatt, Westvaco Chlorine. "Shorty" became a "Pop" on Dec. 30, the new arrival is William John. No wonder the serious expression!

Right, "Phil" LoBue, Joseph Turner & Co., chairman of the Entertainment Committee. Below, Ira Vandewater, R. W. Greeff & Co.



Above, left, "Jack" Butler, Industrial Chemical Sales Div., West Va. Pulp & Paper; right, "Joe" Wafer of the same company, and retiring president of the Association. To the left, "Jim" Selden, R. W. Greeff & Co.
At the extreme right of the page, Major Roland H. Dufault, R. & H. Chemicals Division of Du Pont.
Photographers, "Don" Prior, Prior Chemical, E. L. Luaces, chemical consultant.



Prices Current

Heavy Chemicals, Coal-tar Products, Dye-and-Tanstuffs, Colors and Pigments, Fillers and Sizes, Fertilizer and Insecticide Materials, Petroleum Solvents and Chemicals, Naval Stores, Fats and Oils, etc.

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f. o. b. works are specified as such. Import chemicals are so designated. Resale stocks when a market factor are quoted in addition to maker's prices and indicated "second hands."

Oils are quoted spot New York, ex-dock. Quotations f. o. b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f. o. b., or ex-dock. Materials sold f. o. b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both. Containers named are the original packages most commonly used.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1937 Average $1.10 - Jan. 1939 $1.25 - December 1939 $1.17

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Acetaldehyde, drs. c-l, wks lb	...	.10	.10	.14	...	.14
Acetaldol, 95%, 50 gal drs wks lb.	.21	.25	.21	.25	.21	.25
Acetamide, tech, lcl, kgs lb.	.28	.50	.28	.50	.32	.60
Acetanilid, tech, 150 lb bbls lb.	...	.22	.22	.29	.29	.32
Acetic Anhydride, drs, f.o.b. wks, frt all'd lb.	.10½	.11	.10½	.11	.10½	.11
Acetin, tech, drs. lb.	...	.33		.33	...	.33
Acetone, tks, f.o.b. wks, frt all'd lb.	...	.05¾	.04¼	.06	...	.04¾
drs, c-l, f.o.b. wks, frt all'd lb.	...	.07¼	.05¾	.07¼	...	.05¾
Acetyl chloride, 100 lb cbys lb	.55	.68	.55	.68	.55	.68
ACIDS						
Abietic, kgs, bbls lb	.08¾	.09	.08¾	.09	.08¾	.10
Acetic, 28%, 400 lb bbls, c-l, wks 100 lbs	...	2.23	...	2.23	...	2.23
glacial, bbls, c-l, wks 100 lbs.	...	7.62	...	7.62	...	7.62
glacial, USP bbls, c-l, wks. 100 lbs.	...	10.25	...	10.25	...	10.25
Acetylsalicylic, USP, 225 lb bbls lb.	...	.40	.40	.50	.50	.60
Adipic, kgs, bbls lb.	...	.72	...	.72	...	.72
Anthranilic, ref'd, bbls lb.	1.15	1.20	1.15	1.20	1.15	1.20
tech bbls lb.	...	.75	...	.75	...	.75
Ascorbic, bot oz.	2.75	3.00	2.75	3.25	...	...
Battery, cbys, wks 100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic tech, 100 lb kgs lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ton *a*	...	96.00	...	96.00	95.00	96.00
Broenner's, bbls lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks lb.	...	.22	...	.22	...	.22
wks, lcl lb.	...	.23	...	.23	...	.23
tks, wks lb.	...	.21	...	.21	...	.21
Camphoric, drs lb.	5.50	5.70	5.50	5.70	5.50	5.70
Caproic, normal, drs. lb.	...	.35	...	.35	...	...
Chicago, bbls lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks lb.	.03½	.05	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.15¼	.17¼	.15¼	.17¼	.15¼	.17¼
Citric, USP, crys, 230 lb bbls. lb. *b*	.20	.21½	.20	.22½	.22	.25
anhyd, gran, bbls lb. *b*	...	.23	.23	.25	.25½	.26½
Cleve's, 250 lb bbls lb.	...	.57	...	.57	.50	.57
Cresylic, 99%, straw, HB, drs, wks, frt equal gal.	.68	.70	.49	.70	.63	.91
99%, straw, LB, drs, wks, frt equal gal.	.68	.75	.55	.75	.69	.94
resin grade, drs, wks, frt equal lb.	.08¾	.09¾	.08¼	.09¾	.09	.11¼
Crotonic, bbls, delv lb.	.21	.50	.21	.50	.21	1.00
Formic, tech, 140 lb drs lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls lb.	...	.75	...	.75	.60	.75
Fuming, see Sulfuric (Oleum)						
Gallic, tech, bbls lb.	.70	.73	.70	.73	.70	.79
USP, bbls lb.	.77	.81	.77	.81	.77	.91
Gamma, 225 lb bbls, wks lb.	...	.85	...	.85	...	.85
H, 225 lb bbls, wks lb.	.50	.55	.50	.55	.50	.55
Hydriodic, USP, 47% lb.	...	2.30	...	2.30	2.20	2.30
Hydrobromic, 34% conct 155 lb cbys, wks lb.	.42	.44	.42	.44	.42	.44
Hydrochloric, see muriatic						
Hydrocyanic, cyl, wks lb.	.80	1.30	.80	1.30	.80	1.30
Hydrofluoric, 30%, 400 lb bbls, wks lb.	.06	.06½	.06	.07½	.07	.07½
Hydrofluosilicic, 35%, 400 bbls, wks lb.	.09	.09½	.09	.09½	.09	.15
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.02¾	.02½	.02¾	.02½	.02¾
22%, light ref'd, bbls lb.	.03½	.03¾	.03½	.03¾	.03½	.03¾
44%, light, 500 lb bbls lb.	.05½	.05¾	.05½	.05¾	.05½	.05¾
44%, dark, 500 lb bbls lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
50%, water white, 500 lb bbls lb.	.10½	.11½	.10½	.11½	.10½	.11½
USP X, 85%, cbys lb.	.42	.45	.42	.45	.42	.45
Lauric, drs. lb.	11¾	.12¼	.11¾	.12¼	.08½	.12¼
Laurent's, 250 lb bbls lb.	.45	.46	.45	.46	.45	.46
Levulinic, 5 lb bot wks lb.	...	2.00	...	2.00	...	2.00
Linoleic, bbls lb.	...	.20	...	.20	...	.20
Maleic, powd, kgs lb.	.30	.40	.30	.40	.30	.40
Malic, powd, kgs lb.	.45	.60	.45	.60	.45	.60
Metanillic, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Mixed, tks, wks N unit	.06½	.07¼	.06½	.07¼	.06½	.07¼
S unit	.008	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.16	.18	.16	.18	.16	.18
Monosulfonic, bbls lb.	1.50	1.60	1.50	1.60	1.50	1.60

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls., *y* Price given is per gal.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Muriatic, 18°, 120 lb cbys, c-l, wks 100 lb.	...	1.50	...	1.50	...	1.50
tks, wks 100 lb.	...	1.00	...	1.00	...	1.00
20°, cbys, c-l, wks 100 lb.	...	1.75	...	1.75	...	1.75
tks, wks 100 lb.	...	1.10	...	1.10	...	1.10
22°, c-l, cbys, wks 100 lb.	...	2.25	...	2.25	...	2.25
tks, wks 100 lb.	...	1.60	...	1.60	...	1.60
CP, cbys lb.	.06½	.07⅛	.06½	.07⅛	.06½	.07⅛
N & W, 250 lb bbls lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.14	nom.	.10	.14	.10	.13
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks 100 lb. *c*	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. *c*	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. *c*	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. *c*	...	6.50	...	6.50	...	6.50
CP, cbys, delv lb.	.11½	.12½	.11½	.12½	.11½	.12½
Oxalic, 300 lb bbls, wks, or N Y lb.	.10¾	.12	.10¾	.12	.10¾	.12
Phosphoric, 85%, USP, cbys lb.	.12	.14	.12	.14	.12	.14
50%, acid, c-l, drs, wks lb.	.06	.08	.06	.08	.06	.08
75%, acid, c-l, drs, wks lb.	...	.07½	...	.07½	.07½	.10½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks lb.	.35	.40	.35	.40	.35	.40
Propionic, 98% wks, drs lb.	...	.22	...	.22	...	.22
80% lb.	.16	.17½	.16	.17½	.16	.17½
Pyrogallic, tech, lump, pwd, bbls lb.		1.05	...	1.05	...	1.05
cryst, USP lb.	1.45	1.63	1.45	1.63	1.45	1.63
Ricinoleic, bbls lb.	...	.35	...	.35	.35	.38
tech, bbls lb.	...	.13	...	.13	...	.13
Salicylic, tech, 125 lb bbls, wks lb.	...	.33	...	.33	...	.33
USP, bbls lb.	.35	.40	.35	.40	.35	.45
Sebacic, tech, drs, wks lb.	...	nom.	...	nom.	.37	.41
Succinic, bbls lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	.17	.18	.17	.18	.17	.18
Sulfuric, 60°, tks, wks ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks 100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks 100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks lb.	.06½	.07½	.06½	.07½	.06½	.07½
Fuming (Oleum) 20% tks, wks ton	...	18.50	...	18.50		18.50
Tannic, tech, 300 lb bbls lb.	.40	.47	.40	.47	.40	.47
Tartaric, USP, gran, powd, 300 lb bbls lb.	.31¼	.31¾	.27¼	.31¾	.24¼	.27¾
Tobias, 250 lb bbls lb.	.55	.60	.55	.67	.65	.67
Trichloroacetic bottles lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs lb.	...	1.75		1.75		1.75
Tungstic, tech, bbls lb.	...	...	1.70	1.80	1.65	2.00
Vanadic, drs, wks lb.	...	..	1.10	1.20	1.10	1.20
Albumen, light flake, 225 lb. bbls lb.	.55	.68	.52	.68	.52	.60
dark, bbls lb.	.13	.18	.13	.18	.11	.18
egg, edible lb.	.62	.64	.58	.78	.77	1.15
ALCOHOLS						
Alcohol, Amyl (from Pentane) tks, delv lb.	...	.101	...	.101	.101	.106
c-l, drs, delv lb.	...	.111	...	.111	.111	.116
lcl, drs, delv lb.	...	.121	...	.121	.121	.126
Amyl, secondary, tks, delv lb.	...	.08½	...	.08½	...	.08½
drs, c-l, delv E, of Rockies lb.	...	.09½	...	.09½	...	.09½
Benzyl, cans lb.	.68	1.00	.68	1.00	.68	1.00
Butyl, normal, tks, f.o.b. wks, frt all'd lb. *d*	...	.09	.07	.09	.08½	.09
c-l, drs, f.o.b. wks, frt all'd lb. *d*	...	.10	.08	.10	.09½	.10
Butyl, secondary, tks, delv lb. *d*	...	.06½	.05½	.06½	...	.06
c-l, drs, delv lb. *d*	...	.07½	.06½	.07½	...	.07
Capryl, drs, tech, wks lb.		.85		85		85
Cinnamic, bottles lb.	2.00	2.50	2.00	2.50	2.00	2 50
Denatured, CD, 14, c-l, drs, wks gal. *e*	.31½	.36½	.27½	.36½	.31	.35
tks, East, wks gal.	...	.25½	.21½	.25½	.23	.29
Western schedule, c-l, drs, wks gal. *e*	.	.34½	.34½	.37	.36	.38
Denatured, SD, No. 1, tks,	...	.21½	.19½	.22	.22	.27
c-l, drs, wks gal. *e*	...	.28½	.25½	.28½	.28	.33

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Alcohols (continued):						
Diacetone, pure, c-l, drs, delv ....lb. *f*	...	.12	.09	.12	...	.11½
tech, contract, drs, c-l, delv ....lb.	...	.11½	.08½	.11½	...	.10½
Ethyl, 190 proof, molasses, tks ....gal. *g*	...	4.48	4.46	4.48½	4.04	4.51½
c-l, drs ....gal. *g*	...	4.54	4.49	4.54½	4.10	4.59½
c-l, bbls ....gal. *g*	...	4.55	4.53	4.55½	4.11	4.58½
Furfuryl, tech, 500 lb drs lb.	.25	.35	.25	.35	.25	.35
Hexyl, secondary tks, delv lb.		.12		.12	...	.12
c-l, drs, delv ....lb.		.13		.13	...	.13
Normal, drs, wks ....lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv ....lb.	...	.27		.27		.27
Isobutyl, ref'd, lcl, drs ..lb.	...	.073	.073	.09	.09	.10
c-l, drs ....lb.	...	.069	.068	.08½	.08½	.09½
tks ....lb.	...	.059	.058	.07½	.07½	.08½
Isopropyl, ref'd, 91%, c-l, drs, f.o.b. wks, frt all'd ....lb.	...	.36	...	.36	...	.36
Ref'd 98%, drs, f.o.b. wks, frt all'd .....gal.	...	.41	...	.41	...	.41
Tech 91%, drs, above terms ....gal.	...	.33½	...	.33½	...	.33½
tks, same terms ..gal.	...	.28½	...	.28½	...	.28½
Tech 98%, drs, above terms ....gal.	...	.37½	...	.37½	...	.37½
tks, above terms ..gal.	...	.32½		.32½		.32½
Spec Solvent, tks, wks gal.	...	.23½	.19	.23½	.23	.28
Aldehyde ammonia, 100 gal drs ....lb.	.80	.82	.80	.82	.80	.82
Aldehyde Bisulfite, bbls, delv ....lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv ....lb.	.11	.12	.11	.20	...	.20
Alphanaphthol, crude, 300 lb bbls ....lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls ....lb.	.32	.34	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks ....100 lb.	...	3.75	3.40	3.75	3.40	3.65
delv NY, Phila ...100 lb.	...	3.75	3.40	3.75	...	3.40
Granular, c-l, bbls wks ....100 lb.	...	3.50	3.15	3.50	3.15	3.40
Powd, c-l, bbls, wks 100 lb.	...	3.90	3.55	3.90	...	3.55
Chrome, bbls ......100 lb.	6.50	6.75	6.50	6.75	6.50	6.75
Potash, lump, c-l, bbls, wks ....100 lb.	...	4.00	3.65	4.00	3.65	3.90
Granular, c-l, bbls, wks ....100 lb.	...	3.75	3.40	3.75	3.40	3.65
Powd, c-l, bbls, wks 100 lb.	...	4.15	3.80	4.15	3.80	4.05
Soda, bbls, wks ....100 lb.	...	3.25		3.25		3.25
Aluminum metal, c-l, NY 100 lb.	...	20.00	...	20.00	...	20.00
Acetate, 20%, bbls ...lb.	.07½	.09	.07½	.09	.07½	.10
Basic powd, bbls, delv. lb.	.40	.50	.40	.50	.40	.50
Chloride anhyd, 99%, wks lb.	.08	.12	.06	.12	.07	.12
93%, wks ....lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks lb.	.06	.06¼	.06	.06¼	.06	.06¼
Solution, drs, wks ...lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv ....lb.	...	.13	...	.13	...	.13
Hydrate, 96%, light, 90 lb bbls, delv ....lb.	.12½	.13½	.11½	.13	.12	.13
heavy, bbls, wks .....lb.	.029	.03½	.029	.03½	.029	.03½
Oleate, drs ....lb.	.16¾	.18½	.16¾	.18½	.16¾	.18½
Palmitate, bbls ....lb.	...	.24½	.23	.24½	...	.23
Resinate, pp., bbls ....lb.	...	.15	...	.15	...	.15
Stearate, 100 lb. bbls ..lb.	.17½	.22½	.16	.22½	.19	.21
Sulfate, com, c-l, bgs, wks ....100 lb.	...	1.15	...	1.15	1.15	1.35
c-l, bbls, wks ....100 lb.	...	1.35	...	1.35	1.35	1.55
Sulfate, iron-free, c-l, bgs, wks. ....100 lb.	...	1.45	...	1.45	...	1.30
c-l, bbls, wks ....100 lb.	...	1.65	...	1.65	...	1.50
Aminoazobenzene, 110 lb kgs lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd fert com, tks lb.	.04½	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	.16	.22	.16	.22	.16	.22
26°, 800 lb drs, delv lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH ..cont.	...	.04z	...	.04z	...	.05**
tk wagon ....lb.	...	.02	...	.02	...	.02
Ammonium Acetate, kgs ..lb.	.26	.33	.26	.33	.26	.33
Bicarbonate, bbls, f.o.b. wks ....100 lb.	...	5.56	5.15	5.71	5.15	5.71
Bifluoride, 300 lb bbls ..lb.	.14½	.16½	.14½	.16½	.14½	.17
carbonate, tech, 500 lb bbls ....lb.	.08	.12	.08	.12	.08	.12
Chloride, White, 100 lb bbls, wks ......100 lb.	4.45	4.90	4.45	4.90	4.45	4.90
Gray, 250 lb bbls, wks .... 100 lb.	5.50	6.25	5.50	6.25	5.50	6.25
Lump, 500 lb cks spot lb.	.10½	.11	.10½	11.	.10½	.11
Lactate, 500 lb bbls ...lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls ....lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls ....lb.	...	.12	.11	.15	...	.15
Naphthenate, bbls .....lb.	...	.17	...	.17	...	.17
Nitrate, tech, bbls .....lb.	...	.0455	.036	.0455	.038	.0405
Oleate, drs ....lb.	...	.14	.11	.14	...	.15
Oxalate, neut, cryst, powd, bbls ....lb.	.19	.20	.19	.20	.19	.22½
Perchlorate, kgs ....lb.	...	.16	...	.16	...	.16
Persulfate, 112 lb kgs ..lb.	.21	.24	.21	.24	.21	.24
Phosphate, dibasic tech, powd, 325 lb bbls ...lb.	.07½	.10	.07½	.10	.07½	.10
Ricinoleate, bbls ......lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls ..lb.	...	.24½	.22	.24½	...	.24
Paste, bbls ....lb.	...	.06½	.06½	.08	...	.07½

g Grain alcohol 25c a gal. higher in each case. **On a delv. basis.
z On a f.o.b. wks. basis.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Ammonium (continued):						
Sulfate, dom, f.o.b., bulk ton	...	28.00	27.00	28.00	27.00	28.50
Sulfocyanide, pure, kgs .lb.	...	.65	.55	.65	...	.55
Amyl Acetate (from pentane)						
tks, delv ....lb.	...	.095	.095	.10	.10	.11½
c-l, drs, delv ....lb.	...	.105	.105	.11		
lcl, drs, delv........lb.	...	.115	.115	.112	...	
tech, drs, delv ......lb.	...	.12½	.10½	.12½	.11	.10½
Secondary, tks, delv. .lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	...	.09½
tks, delv ....lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks lb.	.56	.68	.56	.68	.56	.68
mixed, drs, wks .....lb.	.0565	.0665	.0565	.077	.07	.077
tks, wks ....lb.	...	.0465	.0465	.06	...	.06
Mercaptan, drs, wks ...lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs ...lb.	...	.25	...	.25	...	.25
Stearate, lcl, wks, drs ..lb.	...	.26	...	.26	...	.26
Amylene, drs, wks ....lb.	.102	.11	.102	.11	.102	.11
tks, wks ....lb.	...	.09	...	.09		.09
Aniline Oil, 960 lb drs and tks ....lb.	.14½	.17½	.14½	.17½	.14½	.17½
Annatto fine ....lb.	.34	.39	.34	.39	.34	.37
Anthracene, 80% ....lb.	...	.55	.55	.75	...	.75
Anthraquinone, sublimed, 125 lb bbls ....lb.	...	.65	...	.65	...	.65
Antimony metal slabs, ton lots ....lb.	.14	nom.	.11¼	.14	.10¾	.14
Butter of, see Chloride.						
Chloride, soln, cbys....lb.	...	.17	...	.17		.17
Needle, powd, bbls ....lb.	.20	nom.	.12	.20	.12½	.16
Oxide, 500 lb bbls .....lb.	.15¾	nom.	.10	.15¾	.11½	.16½
Salt, 63% to 65%, tins lb.	.42	nom.	.25¾	.42	.26	.27
Archil, conc, 600 lb bbls .lb.	.21	.27	.21	.27	.21	.27
Double, 600 lb bbls ....lb.	.18	.20	.18	.20	.18	.20
Aroclors, wks ....lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls ....lb.	.08½	.09	.08½	.09	.08½	.09
Arsenic, Metal ....lb.	...	...	.40	.60	.40	.44
Red, 224 lb cs kgs ...lb.	.19	.20	.18	.19	...	.15¾
White, 112 lb kgs .....lb.	.03	.03¾	.03	.03¾	.03	.04

B

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Barium Carbonate precip, 200 lb bgs, wks ....ton	52.50	62.50	52.50	62.50	52.50	62.50
Nat (witherite) 90% gr, c-l, wks, bgs .....ton	45.00	47.00	41.00	47.00	41.00	44.00
Chlorate, 112 lb kgs, NY lb.	.20	.25	.16½	.25	.16½	.17½
Chloride, 600 lb bbls, delv, zone 1 ....ton	77.00	92.00	77.00	92.00	77.00	.92.00
Dioxide, 88%, 690 lb drs lb.	.11	.12	.11	.12	.11	.12
Hydrate, 500 lb bbls ...lb.	.04½	.05	.04½	.05½	.04¾	.05½
Nitrate, bbls ....lb.	.10½	nom.	.06¾	.10½	.06¾	.08¼
Barytes, floated, 350 lb bbls c-l, wks ....ton	...	23.65	...	23.65	...	23.65
Bauxite, bulk, mines ....ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ....ton	...	16.00	...	16.00	...	16.00
200 mesh ....ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks ....lb.	.60	.62	.60	.62	.60	.62
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd .gal.	...	.16	...	.16	...	.16
90% c-l, drs ....gal.	...	.21	...	.21	...	.21
Ind pure, tks, frt all'd gal.	...	.16	...	.16	...	.16
Benzidine Base, dry, 250 lb bbls ....lb.	.70	.72	.70	.72	.70	.72
Benzoyl Chloride, 500 lb drs lb.	.40	.45	.40	.45	.40	.45
Benzyl Chloride, 95-97% rfd, drs ....lb.	.30	.40	.30	.40	.30	.40
Tech, drs ....lb.	.25	.26	.25	.26	.25	.26
Beta-Naphthol, 250 lb bbls, wks ....lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls ....lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls ....lb.	.51	.52	.51	.52	.51	.52
Bismuth metal ....lb.	...	1.25	1.05	1.25	1.00	1.10
Chloride, boxes ....lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes .....lb.	3.35	3.40	3.15	3.40	3.15	3.20
Oxychloride, boxes .....lb.	...	3.10	2.95	3.10	...	2.95
Subbenzoate, boxes .....lb.	3.25	3.30	3.25	3.30	3.25	3.30
Subcarbonate, kgs .....lb.	1.73	1.76	1.43	1.76	1.13	1.58
Trioxide, powd, boxes .lb.	...	3.57	...	3.57	...	3.57
Subnitrate, fibre, drs ..lb.	1.48	1.51	1.23	1.51	1.03	1.48
Blanc Fixe, 400 lb bbls, wks ton *h*	47.50	80.00	40.00	80.00	40.00	75.00
Bleaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	...	2.00	...	2.00	...	2.00
lcl, drs, wks ....lb.	2.25	3.60	2.25	3.60	2.25	3.60
Blood, dried, f.o.b., NY unit	...	3.90	2.50	4.25	2.50	3.25
Chicago, high grade ..unit	...	3.90	2.30	4.25	2.35	3.35
Imported shipt ......unit	...	3.45	2.65	3.90	2.90	3.45
Blues, Bronze Chinese Milori Prussian Soluble ....lb.	.33	.34	.33	.37	.36	.37
Ultramarine,* dry, wks, bbls .... lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	...	.16	...	.16	...	.16
Special, group 1 .....lb.	...	.19	...	.19	...	.19
Pulp, No. 1 ....lb.	...	.27	...	.27	...	.27
Bone, 4½ + 50% raw, Chicago ....ton	32.00	35.00	27.00	35.00	25.50	30.00
Bone Ash, 100 lb kgs .....lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50%, imp ton	32.00	nom.	22.00	32.00	20.50	23.75
Domestic, bgs, Chicago ton	31.00	32.00	24.00	32.00	16.00	26.00
Borax, tech, gran, 80 ton lots, sacks, delv ....ton *i*	...	43.00	...	43.00	42.00	43.00
bbls, delv ....ton *i*	...	53.00	...	53.00	52.00	53.00

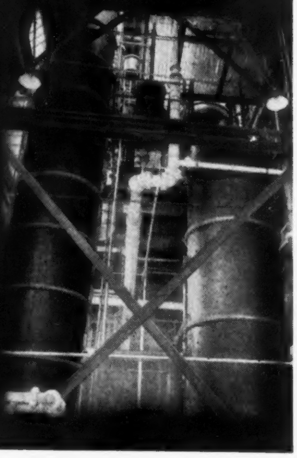
h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Borax (continued)						
Tech, powd, 80 ton lots, sacks ... ton *i*	...	47.00	...	47.00	...	47.00
bbls, del ton *i*		57.00		57.00		57.00
Bordeaux M .ture, drs ... lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases ... lb.	.30	.43	.30	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	.90½	.92½	.90½	.92½	.90½	.92½
Gold, blk ... lb.	.45	.65	.45	.65	.45	.65
Butanes, com 16-32° group 3 tks ... lb.	.02¼	.03¾	.02¼	.03¾	.02¼	.03¾
Butyl, Acetate, norm drs, frt allowed ... lb.	...	.10	.09	.10	.09½	.10½
tks, frt allowed ... lb.	...	.09	.08	.09	.08½	.09
Secondary, tks, frt allowed ... lb.	...	.06½	.05½	.06½	.06½	.07
drs, frt allowed ... lb.	.07½	.08	.068	.08	.07½	.08½
Aldehyde, 50 gal drs, wks ... lb	.15½	.17½	.15½	.17½	.16½	.17½
Carbinol, norm drs, wks lb.	.60	.75	.60	.75	.60	.75
Crotonate, norm, 55 and 110 gal drs, delv ... lb.	...	.35	35	.75	...	...
Lactate ... lb.	.23½	.24½	.22½	.24½	.22½	.23½
Oleate, drs. frt allowed lb.		.25		25		.25
Propionate, drs ... lb.	.16½	.17	.16½	.18½	.18	.18½
tks, delv ... lb.		.15½	.15½	.17	...	.17
Stearate, 50 gal drs ... lb.	...	.28½	.26½	.28½	...	.26
Tartrate, drs ... lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
C						
Cadmium Metal ... lb.	.75	.80	.50	.85	.85	1.60
Sulfide, orange, boxes. lb.	.75	.85	.75	.90	.80	1.60
Calcium, Acetate, 150 lb bgs c-l, delv ... 100 lb.	...	1.90	1.65	1.90	...	1.65
Arsenate, c-l, E. of Rockies, dealers, drs ... lb.	.06¾	.07¼	.06¾	.07¼	.06¾	.07¼
Carbide, drs ... lb.	.05	.06	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l ... lb.	...	1.00	...	1.00	...	1.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv .. ton	...	22.00	...	22.00	22.00	23.50
paper bgs, c-l, delv .. ton	23.00	36.00	23.00	36.00	23.00	36.00
Solid, 650 lb drs, c-l, delv ... ton	...	20.00	...	20.00	20.00	21.50
Ferrocyanide, 350 lb bbls wks ... lb.	...	.17	...	.17	...	.17
Gluconate, Pharm, 125 lb bbls ... lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks ... lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bgs ... ton	...	28.00	...	28.00	...	28.00
Palmitate, bbls ... lb.	.22	.23	.22	.23	.22	.23
Phosphate, tribasic, tech, 450 lb bbls ... lb.	.06½	.07½	.06½	.07½	.06½	.07½
Resinate, precip, bbls .. lb	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls .. lb.	.19	.21	.19	.21	.19	.21
Camphor, slabs ... lb.	.77	nom.	.46	.77	.52	.56
Powder ... lb.	.77	nom.	.45	.77	.52	.56
Carbon Bisulfide, 500 lb drs lb.	.05	.05¾	.05	.05¾	.05	.05¾
Black, c-l, bgs, delv, price varying with zone† .. lb.	.02¾	.03¾	.02¾	.03¾	.027	.0380
lcl, bgs, f.o.b. whse .. lb.	...	.06¼	...	.06¼	.05¾	.06¼
cartons, f.o.b. whse ... lb.	...	.06¼	...	.06¼	...	.06¼
cases, f.o.b. whse ... lb.	...	.07	...	.07	...	.07
Decolorizing, drs, c-l ... lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv ... lb.	.05	.05½	.05	.05½	.05	.06
Casein, Standard, Dom, grd lb.	.16	.17	.07	.23	.06½	.13½
80-100 mesh, c-l, bgs .. lb.	.16½	.17½	.07½	.23½	.07	.14
Castor Pomace, 5½ NH_3, c-l, bgs, wks ... ton	...	17.50	.16.50	18.50	18.50	21.00
Imported, ship, bgs ... ton	...	20.00	18.00	20.00	20.00	21.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs ... lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs ... lb.	...	.35	.35	.36	.36	.40
Chalk, dropped, 175 lb bbls lb.	.02¾	.03¾	.02¾	.03¾	.02¾	.03¾
Precip, heavy, 560 lb cks lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.04
Light, 250 lb cks ... lb.	.03¼	.04	.03¼	.04	.03¼	.04
Charcoal, Hardwood, lump, blk, wks ... bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* .. ton	25.00	36.00	23.00	36.00	23.00	34.00
Willow, powd, 100 lb bbls, wks ... lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified, tks, wks lb.	...	.01⅝	.	.01⅝	.01⅝	.02125
25%, bbls, wks ... lb.	...	.02	...	.02	.02	.0225
Pwd, 60%, 100 lb bgs, wks ... lb.	...	.04½	...	.04½	.04½	.04⅞
China Clay, c-l, blk mines ton	...	7.60	7.00	7.60	...	7.00
Imported, lump, blk . ton	26.00	nom.	22.00	26.00	22.00	25.00
Chlorine, cyls, lcl, wks, contract ... lb.	.07½	.08½	.07½	.08½	.07½	.08½
cyls, c-l, contract ... lb.	...	.05¼	.05¼	.05½	...	.05½
Liq, tk. wks, contract 100 lb.	...	1.75	1.75	2.00	2.00	2.15
Multi, c-l, cyls, wks. cont ... lb.	...	1.90	1.90	2.15	2.30	2.55
Chloroacetophenone, tins, wks ... lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb drs, lcl, wks ... lb.	.06	.07½	.06	.07½	.06	.07½
Chloroform, tech, 1000 lb drs ... lb.	.20	.21	.20	.21	.20	.21
USP, 25 lb tins ... lb.	.30	.31	.30	.31	.30	.31
Chloropicrin, comml cyls . lb.		.80	...	.80	...	.80
Chrome, Green, CP ... lb.	.21	.25	.21	.25	.21	.25
Yellow ... lb.	.13½	.14½	.13½	.15½	.14½	.15½

i A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Chromium Acetate, 8% Chrome, bbls ... lb.	.05	.08	.05	.08	.05	.08
Fluoride, powd, 400 lb bbl ... lb.	.27	.28	.27	.28	.27	.28
Coal tar, bbls ... bbl.	7.50	8.00	7.50	8.00	7.50	8.00
Cobalt Acetate, bbls ... lb.	...	.71	.65	.71	.65	.68
Carbonate tech, bbls ... lb.	1.38	1.60	1.25	1.63	...	1.63
Hydrate, bbls ... lb.	...	1.78		1.78	1.36	1.78
Linoleate, solid, bbls ... lb.	...	.33		.33		.33
paste, 6%, drs ... lb.	...	.31		.31		.31
Oxide, black, bgs ... lb.	...	1.84	1.67	1.84	.	1.67
Resinate, fused, bbls ... lb.	...	.13½		13½		.13½
Precipitated, bbls ... lb.		.34		.34		.34
Cochineal, gray or bk bgs lb.	.35	.38	.35	.38	.35	.38
Teneriffe silver, bgs ... lb.	.36	.39	.36	.39	.36	.39
Copper, metal, electrol 100 lb.	...	12.50	10.00	12.50	9.00	11.25
Acetate, normal, bbls, wks ... lb.	.22	.24	.21	.24	.21	.23
Carbonate, 52-54% 400 lb. bbls ... lb.	.169	nom.	.14½	.169	.1340	.16¾
Chloride, 250 lb bbls ... lb.	.18	nom.	.12½	.18	.12½	.17
Cyanide, 100 lb drs ... lb.	...	.34		.34	.34	.38
Oleate, precip, bbls ... lb.	...	.20		.20		.20
Oxide, black, bbls, wks lb.	.18¾	nom.	.15	.18¾	.13½	.17¾
red 100 lb bbls ... lb.	.20	nom.	.15¾	.20	.15	.19775
Sub-acetate verdigris, 400 lb bbls ... lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	4.75	4.10	4.75	4.00	4.50
Copperas, crys and sugar bulk c-l, wks ... ton	...	16.00	14.00	16.00	12.00	14.00
Corn Sugar, tanners, bbls 100 lb.	...	2.99	2.89	3.19	2.95	3.30
Corn Syrup, 42°, bbls 100 lb.	...	3.02	2.92	3.17	2.89	3.16
43°, bbls ... 100 lb.	...	3.07	2.97	3.22	2.94	3.21
Cotton, Soluble, wet, 100 lb bbls ... lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls ... lb.	.25¼	.25¾	.22¼	.25¾	.19¾	.23¼
Creosote, USP, 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1 tks ... gal.	.13½	.14	.13½	.14	.13½	.14
Grade 2 ... gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs ... lb.	.09¾	.10¼	.09½	.10½	.10	.12½
Crotonaldehyde, 97%, 55 and 110 gal drs, wks ... lb.	.11	.12	.11	.22*	.22*	.30*
Cutch, Philippine, 100 lb bale lb.	...	.04	.04	.04½	.04	.06
Cyanamid, pulv, bags c-l, frt all'w'd, nitrogen basis, unit	...	1.27½	...	...	...	...
D						
Derris root 5% rotenone, bbls ... lb.	.24	.30	.24	.30	.34	.43
Dextrin, corn, 140 lb bgs f.o.b., Chicago ... 100 lb.	3.40	3.60	3.30	3.75	3.30	3.75
British Gum, bgs ... 100 lb.	3.65	3.75	3.55	3.95	3.55	4.00
Potato, Yellow, 220 lb bgs lb.	...	.07¾	.07	.08¾	.07¼	.08¾
White, 220 lb bgs, lcl lb.	.08½	.09	.08	.09	.08	.09
Tapioca, 200 bgs, lcl ... lb.	...	.0715	...	.0715	.0715	.08
White, 140 lb bgs .. 100 lb.	3.35	3.55	3.25	3.70	3.30	3.70
Diamylamine, c-l, drs, wks lb.	...	.47	...	.47	.47	.75
l.c.l. drs, wks ... lb.	...	.50	...	...	...	...
tks, wks ... lb.	...	.45	...	...	...	...
Diamylene, drs, wks ... lb.	.095	.102	.095	.102	.095	.102
tks, wks ... lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ... lb.	.085	.092	.085	.092	.085	.092
tks, wks ... lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks .. lb.	...	.30	...	.30	...	.30
Diamylphthalate, drs, wks lb.	.21	.21½	.19	.21	.19	.21
Diamyl Sulfide, drs, wks .. lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks ... lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	...	.53	.53	.55	...	.55
c.l. drs, wks ... lb.	...	.50	...	...	...	...
tks, wks ... lb.	...	.48	...	...	...	...
Dibutyl Ether, drs, wks, lcl lb.	.24½	.25	.24½	.25	.25	.30
Dibutylphthalate, drs, wks, frt all'd ... lb.	.19	.19½	.19	.19½	.19	.21
Dibutyltartrate, 50 gal drs lb.	...	.50	.45	.54	.45	.54
Dichlorethylene, drs ... lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks ... lb.	.15	.16	.15	.16	.15	.16
tks, wks ... lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	no prices		no prices		...	...
tks, wks ... lb.	no prices		no prices		...	...
Diethanolamine, tks, wks .. lb.	...	.22½	.22½	.23	...	.2[illegible]
Diethylamine, 400 lb drs, lcl, f.o.b., wks ... lb.	...	.70	.70	3.00	2.75	3.00
Diethylaniline, 850 lb drs lb.	.40	.52	.40	.52	.40	.50
Diethyl Carbinol, drs ... lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	.31¾	.35	.31¾	.35	.31¾	.35
Diethylorthotoluidin, drs .. lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs lb.	.19	.19½	.19	.19½	.19	.19½
Diethylsulfate, tech, drs, wks, lcl ... lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ... lb.	.14½	.15½	.14½	.17	.16	.17
Mono ethyl ethers, drs .. lb.	.15	.16	.15	.16	.15	.16
tks, wks ... lb.	...	.13½	.13½	.14	...	.14
Mono butyl ether, drs .. lb.	.23	.24	.23	.24	.23	.24
tks, wks ... lb.	.	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks ... lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ... lb.	.17	.21	.15	.23	...	.27½
Oleate, bbls ... lb.	...	.13	.13	.20	...	.21
Stearate, bbls ... lb.	...	.26	.20	.28	...	.27½
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis ... lb.	...	1.00	...	1.00	...	1.00
Dimethylaniline, 340 lb drs lb.	.23	.24	.23	.24	.23	.27
Dimethyl Ethyl Carbinol, drs lb.	.60	.75	.60	.75	.60	.75

k Higher price is for purified material; * These prices were on a delivered basis.



	Current Market		1939 Low	1939 High	1938 Low	1938 High
Dimethyl phthalate, drs, wks, frt allowed ....lb.	...	.19	...	.19		.19
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb. k	.18	.19	.16	.19	.16	.19
Dinitrochlorobenzene, 400 lb bbls ....lb.	...	.14	.13½	.14	.13½	.14
Dinitronaphthalene, 350 lb bbls ....lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	.22	.23	.22	.24	.23	.24
Dinitrotoluene, 300 lb bbls lb.	...	.15½	...	.15½	...	.15½
Diphenyl, bbls ....lb.	.15	.25	.15	.25	.15	.25
Diphenylamine ....lb.	.31	.32	.32	.32	.31	.32
Diphenylguanidine, 100 lb drs ....lb.	.35	.37	.31	.37	.31	.32
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton		nom.		nom.	...	nom.
Extract ....lb.	.05¾	.06¾	.05¾	.06¾	.05	.06¾
E						
Egg Yolk, dom., 200 lb cases lb.	.60	.62	.59	.69	.60	.69
Epsom Salt, tech, 300 lb bbls c-l, NY ....100 lb.	1.90	2.10	1.90	2.10	1.90	2.10
USP, c-l, bbls ....100 lb.	...	2.10		2.10		2.10
Ether, USP anaesthesia 55 lb drs ....lb.	.22	.23	.22	.23	.22	.23
(Conc) ....lb.	.09	.10	.09	.10	.09	.10
Isopropyl 50 gal drs ...lb.	.07	.08	.07	.08	.07	.08
tks, frt allowed ....lb.	...	.06	..	.06	..	.06
Nitrous conc bottles ...lb.	...	.68		.68		.68
Synthetic, wks, drs lb.	.08	.09	.08	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd ....lb.	...	.06½	.051	.061	.051	.05½
drs, frt all'd ....lb.	.07½	.08	.061	.08	.061	.06½
99%, tks, frt all'd ...lb.	...	.0685	.0585	.0685	.0585	.06¾
drs, frt all'd ....lb.	...	.0785	.0685	.0785	.0685	.07¾
Acetoacetate, 110 gal drs lb.	...	.27½		.27½		.27½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech, drs ... lb.	.50	.55	.50	.55	.50	.55
Cellullose, drs, wks, frt all'd ....lb.	.45	.50	.45	.50	.45	1.00
Chloride, 200 lb drs ...lb.	.22	.24	.22	.24	.22	.24
Chlorocarbonate, cbys ..lb.	...	.30	...	.30		.30
Crotonate, drs ....lb.	...	.35	.35	.75	1.00	1.25
Formate, drs, frt all'd..lb.	.27	.28	.27	.28	.27	.28
Lactate, drs, wks ....lb.		.33		.33		.33
Oxalate, drs, wks ....lb.	.30	.34	.30	.34	.30	.34
Oxybutyrate, 50 gal drs, wks ....lb.	.30	.30½	.30	.30½	.30	.30½
Silicate, drs, wks ....lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs ....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb.	.75	.85	.75	.85	.75	.85
Anhydrous ....lb.		.75		.75		.75
Dichloride, 50 gal drs, wks lb.	.0595	.0694	.0545	.0994	.0545	.0994
Glycol, 50 gal drs, wks..lb.	.14½	18½	14½	.21	.17	.21
tks, wks ....lb.	...	.13½	.13½	.16	...	.16
Mono Butyl Ether, drs, wks ....lb.	.16½	.21	.16½	.22	.20	.21
tks, wks ....lb.	...	.15½	.15½	.19	...	.19
Mono Ethyl Ether, drs, wks ....lb.	.14½	.15	.14½	.17	.16	.17
tks, wks ....lb.	...	.13½	.13½	.15	...	.15
Mono Ethyl Ether Acetate, drs, wks ....lb.	.11½	.13	.11½	.14	...	.14
tks, wks ....lb.	...	.10½	.10½	.13	...	.13
Mono Methyl Ether, drs wks ....lb.	.16	.17	.16	.22	.18	.22
tks, wks ....lb.	...	.14½	.14½	.17	...	.17
Oxide, cyl ....lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline ....lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ....ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk, wks ....ton	14.00	14.50	14.00	14.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls ....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys ....lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
Fish Scrap, dried, unground wks ....unit l	...	4.25	3.00	4.25	2.75	3.30
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis .... unit m	...	3.00	2.35	3.00	2.50	2.50
Fluorspar, 98% bgs ....lb.	...	32.60	30.00	33.00	...	33.00
Formaldehyde, USP, 400 lb bbls, wks ....lb.	.05¾	.06¼	.05¾	.06¼	.05¾	.06¼
Fossil Flour ....lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	10.00	11.00	10.00	11.00	10.00	11.00
Imp powd, c-l, bgs ...ton	23.00	30.00	23.00	30.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb. drs ....lb.	...	.30	...	.30	.	.30
Fusel Oil, 10% impurities lb.	.16	.17¼	.12½	.17¼	.12½	.14
Fustic, crystals, 100 lb boxes ....lb.	.24	.28	.22	.28	.22	.26
Liquid 50°, 600 lb bbls lb.	.10½	.14	.09½	.14	.09½	.13
Solid, 50 lb boxes ......lb.	.19	.21	.17½	.21	.17½	.19½
G						
G Salt paste, 360 lb bbls..lb.	.45	.47	.45	.47	.45	.47
Gambier, com 200 lb bgs lb.	...	.07	.06¾	.07¾	.06¾	.07¾
Singapore cubes, 150 lb bgs ....100 lb.	...	.10	.08	.10	.08½	.11
Gelatine, tech, 100 lb cs ..lb.	.42	.43	.42	.50	.45	.50
Glauber's Salt, tech, c-l, bgs, wks* ....100 lb.	.95	1.18	.95	1.18	.95	1.15
Anhydrous, see Sodium Sulfate						

l + 10; *m* + 50; * Bbls. are 20c higher.

		Current Market		1939 Low	1939 High	1938 Low	1938 High
Glue, bone, com grades, c-l bgs	lb.	.13½	.15½	.11½	.15½	.13	.16½
Better grades, c-l, bgs	lb.	.17	.18	.15	.18	.14½	.16½
Glycerin, CP, 550 lb drs	lb.	...	.12½	...	.12½	.12½	.16
Dynamite, 100 lb drs.	lb.	...	nom.	...	.09	.12¾	.16
Saponification, drs	lb.	.08¾	.09	.08½	.10	.08½	.11¼
Soap Lye, drs	lb.	.07¾	.07⅞	.07½	.07⅞	.07½	.10¼
Glyceryl Bori-Borate, bbls	lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls	lb.	...	.27	...	.27	...	.27
Monostearate, bbls	lb.	...	.30	...	.30	...	.30
Oleate, bbls	lb.	...	.22	...	.22	...	.22
Phthalate	lb.	...	.37	...	.37	...	.37
Glyceryl Stearate, bbls	lb.	...	.18	...	.18	...	.18
Glycol Bori-Borate, bbls.	lb	...	.22	.22	.23	...	.26
Phthalate, drs	lb.	...	.38	.38	.40	...	.40
Stearate, drs	lb.	...	.24	.24	.27½	...	.27½
GUMS							
Gum Aloes, Barbadoes	lb.	.85	.90	.85	.90	.85	.90
Arabic, amber sorts	lb.	.17½	.18	.09	.24	.09	.12
White sorts, No. 1, bgs	lb.	.35	nom.	.23	.35	.23	.28
No. 2, bgs	lb.	.34	nom.	.21	.34	.21	.26
Powd, bbls	lb.	.20½	.21	.12½	.27	.12	.16
Asphaltum, Barbadoes (Man-jak) 200 lb bgs, f.o.b., NY	lb.	.02½	.10½	.02½	.10½	.02½	.10½
California, f.o.b. NY, drs	ton	29.00	55.00	29.00	55.00	29.00	55.00
Egyptian, 200 lb cases, f.o.b. NY	lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases	lb.	.24	.26	.17	.34	.15	.25
Copal, Congo, 112 lb bgs, clean, opaque	lb.	.29½	...	.18¼	.29½	.18¾	.19¼
Dark amber	lb.	.11⅜	nom.	.07⅛	.11⅜	.07⅛	.08⅞
Light amber	lb.	.17	...	.11¼	.17	.11¼	.13¼
Copal, East India, 180 lb bgs							
Macassar pale bold	lb.	.15¼	nom.	.11⅜	.15¼	.11⅜	.13
Chips	lb.	.08½	nom.	.05⅜	.08½	...	.05⅜
Dust	lb.	.06¾	...	.03¼	.07⅛	.03½	.04⅛
Nubs	lb.	.13⅜	nom.	.09½	.13¾	.09⅛	.10⅜
Singapore, Bold	lb.	.17½	...	.14	.18¼	.14½	.15¼
Chips	lb.	.08¾	...	.05⅝	.10¼	.04¾	.05⅜
Dust	lb.	.06¾	...	.03¼	.07⅛	.03¼	.04⅛
Nubs	lb.	.13⅜	...	.09⅝	.14⅜	.10	.10⅜
Copal Manila, 180-190 lb baskets, Loba A	lb.	.14⅞	...	.10½	.14⅞	.10½	.12
Loba B	lb.	.14½	...	.09¾	.14½	.10¼	.11⅝
Loba C	lb.	.14⅛	...	.09	.14⅛	.09¾	.11¼
DBB	lb.	.12½	...	.07⅞	.12½	.07⅞	.08¾
Dust	lb.	.08½	...	.05⅛	.08½	.05⅛	.06⅝
MA sorts	lb.	.11	...	.05⅞	.11	.05⅞	.07¼
Copal Pontianak, 224 lb cases, bold genuine	lb.	...	.18½	.15¼	.18½	.15¼	.16½
Chips	lb.	...	.10½	.07⅛	.11½	.08¼	.10¼
Mixed	lb.	...	.16⅝	.13⅜	.16⅝	...	.14
Nubs	lb.	...	.13½	.10½	.14⅜	.11⅜	.12⅞
Split	lb.	...	.16⅛	.12	.16⅛	.13½	.13⅞
Damar Batavia, 136 lb cases							
A	lb.	...	.22¾	.20	.23¾	.20	.25½
B	lb.	...	.21⅛	.18½	.21⅛	.18½	.24
C	lb.	...	.15¼	.13½	.15⅝	.14⅞	.20⅜
D	lb.	...	.13¾	.12¼	.14¼	.13⅛	.17½
A/D	lb.	...	.14½	.12¾	.15¼	.14½	.20⅜
A/E	lb.	...	.13⅜	.11⅜	.13¾	.12¼	.17¼
E	lb.	...	.10⅜	.07⅜	.10	.07⅜	.08½
F	lb.	...	.08¾	.07¼	.08¾	...	.07¼
Singapore, No. 1	lb.	...	.18⅞	.13¼	.19½	.15¼	.21⅛
No. 2	lb.	...	.14⅞	.10½	.16⅜	.10⅜	.15⅜
No. 3	lb.	...	.08⅝	.05¼	.09⅛	.05	.05¾
Chips	lb.	...	.12½	.09¼	.12½	.09¼	.13½
Dust	lb.	...	.08⅝	.05¼	.09⅛	.05	.05¾
Seeds	lb.	...	.10½	.07⅜	.10½	.07⅜	.09½
Elemi, cns, c-l,	lb.	...	.12⅝	.08⅛	.12⅝	.08⅛	.09½
Ester	lb.	.06½	.07	.06	.07	.06¼	.08½
Gamboge, pipe, cases	lb.	.70	.75	.55	.80	.60	.80
Powd, bbls	lb.	.75	.80	.60	.85	.65	.85
Ghatti, sol. bgs	lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs,	lb.	.14	.33	.14	.33	...	...
Kauri, NY							
Brown XXX, cases	lb.	...	.60	.60	.60½	.60	.60½
BX	lb.	...	.38	...	.38	...	.38
B1	lb.	...	.28	...	.28	...	.28
B2	lb.	...	.24	...	.24	...	.24
B3	lb.	...	.18½	...	.18½	...	.18½
Pale XXX	lb.	...	.61	...	.61	...	.61
No. 1	lb.	...	.41	...	.41	...	.41
No. 2	lb.	...	.24	...	.24	...	.24
No. 3	lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins	lb.	4.00	4.50	2.50	4.50	2.00	2.75
Mastic	lb.	85	.90	.55	.90	.55	.56
Sandarac, prime quality, 200 lb bgs & 300 lb cks.	lb.	.37	nom.	.15	.37	.19	.26
Senegal, picked bags	lb.	.30	nom.	.25	.30	.23	.27
Sorts	lb.	.13	nom.	.09¼	.13	.09¼	.12
Thus, bbls	280 lbs.	15.00	15.25	13.50	15.25	13.50	14.25
Tragacanth, No. 1, cases	lb.	2.50	nom.	2.25	2.50	2.40	3.00
No. 2	lb.	2.40	nom.	1.90	2.40	2.30	2.75
No. 3	lb.	2.25	nom.	1.60	2.25	1.90	2.70
Yacca, bgs	lb.	.08	nom.	.03½	.08	.03½	.04½
H							
Helium, cyl (200 cu. ft.)	cyl.	...	25.00	...	25.00		25.00
Hematine crystals, 400 lb bbls	lb.	.20	.30	.20	.34	.18	.34
Hemlock, 25%, 600 lb bbls.							
wks	lb.	.03⅛	.03⅜	.03	.03⅜	.03	.03¼
tks	lb.	...	.02¾	.02⅝	.02¾	.02⅝	.02¾

Prices

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Hexalene, 50 gal drs, wks lb.	...	.30	...	.30	...	.30
Hexane, normal 60-70° C. Group 3, tks gal.	...	.10½	...	.10½	...	.10½
Hexamethylenetetramine, powd, drs lb.	.32	.33	.32	.36	.35	.36
Hexyl Acetate, secondary, delv, drs lb.	.13	.13½	.13	.13½	.13	.13½
tks lb.	...	.12	...	.12		.12
Hoof Meal, f.o.b. Chicago unit	...	3.00	2.50	3.25	2.35	3.35
Hydrogen Peroxide, 100 vol, 140 lb cbys lb.	.19½	.20	.19½	.20	.19½	.20
Hydroxylamine Hydrochloride lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls lb.	.13	.16	.13	.21	.16	.21
I						
Indigo, Bengal, bbls lb.	...	2.40	...	2.40	...	2.40
Synthetic, liquid lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars lb.	...	2.00	1.75	2.00	1.50	1.75
Irish Moss, ord, bales lb.	.10	.11	.10	.11	.10	.11
Bleached, prime, bales lb.	.19	.20	.19	.20	.19	.20
Iron Acetate Liq. 17°, bbls delv lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.						
Nitrate, coml, bbls 100 lb.	2.32	3.11	2.32	3.11	2.32	3.11
Isobutyl Carbinol (128-132° C) drs, wks lb.	.33	.34	.33	.34	.33	.34
tks, wks lb.	...	.32		.32	...	.32
Isopropyl Acetate, tks, frt all'd lb.	...	.05½	.051	.06	.0510	.05½
drs, frt all'd lb.	.06½	.07	.061	.07	.061	.07
Ether, see Ether, isopropyl.						
Keiselguhr, dom bags, c-l, Pacific Coast ton	22.00	85.00	22.00	85.00	22.00	85.00
L						
Lead Acetate, f.o.b. NY, bbls, White, broken lb.	...	.11	.10	.11	.10	.11
cryst, bbls lb.	...	.11	.10	.11	.10	.11
gran, bbls lb.	...	.11¾	.10¾	.11¾	.10¾	.11¾
powd, bbls lb.	...	.11¾	.10¾	.11¾	.10¾	.11¾
Arsenate, East, drs lb.	...	.11	.10	.11½	.11	.13½
Linoleate, solid, bbls lb.		.19		.19	..	.19
Metal, c-l, NY 100 lb.	5.50	5.55	4.75	5.55	4.00	5.10
Nitrate, 500 lb bbls, wks lb.	.11	.12	.10	.12	.10	.11½
Oleate, bbls lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv lb.	...	.081	.07¼	.08½	.06½	.08
97% Pb_3O_4, delv lb.	...	.0835	.07½	.0835	.06¾	.081
98% Pb_3O_4, delv lb.	...	.0860	.07¾	.0860	.07	.0835
Resinate, precip, bbls lb.	...	.16½	...	.16½	...	.16½
Stearate, bbls lb.	...	.25	.22	.25	.22	.23
Titanate, bbls, c-l, f.o.b. wks, frt all'd lb.	.11	.11½	.11	.11½	.11	.11½
White, 500 lb bbls, wks lb.	...	.07	...	.07	.06	.07
Basic sulfate, 500 lb bbls, wks lb.	...	.06¼	...	.06¼	.05¼	.06¼
Lime, chemical quicklime, f.o.b., wks, bulk ton	7.00	8.00	7.00	8.00	7.00	8.00
Hydrated, f.o.b. wks ton	8.50	12.00	8.50	12.00	8.50	12.00
Lime Salts, see Calcium Salts						
Lime sulfur, dealers, tks gal.	.08	.11½	.08	.11½	.08	.11½
drs gal.	.11	.16	.11	.16	.11	.16
Linseed Meal, bgs ton	...	37.00	34.00	42.00	39.00	45.00
Litharge, coml, delv, bbls lb.	...	.071	.06¼	.071	.05½	.066
Lithopone, dom, ordinary, delv, bgs lb.	...	.03¾	.03¾	.04⅛	.04⅛	.04⅜
bbls lb.	...	.04	.04	.04⅜	.04⅜	.04⅞
High strength, bgs lb.	...	.05¼	.05¼	.05⅝	.05⅝	.06⅛
bbls lb.	...	.05½	.05½	.05⅞	.05⅞	.06⅜
Titanated, bgs lb.	...	.05¼	.05¼	.05⅝	.05⅝	.06⅛
bbls lb	...	.05½	.05½	.05⅞	.05⅞	.06⅜
Logwood, 51°, 600 lb bbls lb.	.10½	.12½	.09½	.12½	.09½	.11½
Solid, 50 lb boxes lb.	.16½	.20½	.15	.20½	.15	.19
M						
Madder, Dutch lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls ton	62.00	66.00	58.00	66.00	60.00	65.00
Magnesium Carb, tech, 70 lb bgs, wks lb.	...	.06¼	.05¾	.06½	.05¾	.07
Chloride flake, 375 lb drs, c-l, wks ton	39.00	42.00	39.00	42.00	39.00	42.00
Fluosilicate, crys, 400 lb bbls, wks lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, calc tech, heavy bbls, frt all'd lb.	.25	.30	.25	.30	.25½	.30½
Light, bbls above basis lb.	.20	.25	.20	.25	.20	.25½
USP Heavy, bbls, above basis lb.	.25	.30	.25	.30	.25	.30½
Palmitate, bbls lb.	.33	nom.	.33	nom.	...	.33
Silicofluoride, bbls lb.	.11	.11½	.09½	.11½	.09½	.10½
Stearate, bbls lb.	.21	.24	.21	.24	.21	.24
Manganese acetate, drs lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.16	.15	.16	.15	.16
Chloride, 600 lb cks lb.	.08¼	.08¾	.07½	.12	.09	.12
Dioxide, tech (peroxide), paper bags, c-l ton	...	66.50	47.50	66.50	47.50	62.50
Hydrate, bbls lb.	...	.32	...	.32	...	.32
Linoleate, liq, drs lb.	.18	.19¼	.18	.19¼	.18	.19¼
solid, precip, bbls lb.	...	.19	...	.19		.19
Resinate, fused, bbls lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs lb.	.08	.08½	.07	.08½	.07	.07½
Mangrove, 55%, 400 lb bbls lb.	...	...	...	.04	...	.04
Bark, African ton	...	35.00	23.00	35.00	23.00	24.50

Current

Mannitol
Nutgalls Alleppo

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Mannitol, pure cryst, cs,wks lb.	.95	1.00	.95	1.20	1.15	1.45
commercial grd, 250 lb bbl ..... lb.	.42	.50	.42	.57	...	...
Marble Flour, blk ..... ton	12.00	14.00	12.00	14.00	12.00	13.00
Mercury chloride(Calomel) lb.	...	2.57	1.36	2.57	1.18	1.59
Mercury metal . . 76 lb. flasks	158.00	nom.	95.00	170.00	73.00	84.50
Mesityl Oxide, f.o.b. dest., tks. ..... lb.	...	.15	.10½	.15	...	...
drs, c.l. ..... lb.	...	.16	.11½	.16	...	...
drs, l.c.l. ..... lb.	...	.16½	.12	.16½	...	...
Meta-nitro-aniline ..... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ..... lb.	1.30	1.40	1.30	1.55	1.45	1.55
Meta-phenylene diamine 300 lb bbls ..... lb.	.80	.84	.80	.84	.80	.84
Meta-toluene-diamine 300 lb bbls ..... lb.	.65	.67	.65	.67	.65	.67
Methanol, denat, grd, drs, c-l, frt all'd ..... gal.	...	.46	.41	.46	.30	.41
tks, frt all'd ..... gal.	...	.40	.35	.40	.25	.35
Pure, drs, c-l, frt all'd gal.	...	.38	...	.38	...	.38
tks ..... gal.	...	.33	...	.33	...	.33
95%, tks ..... gal.	...	.31	...	.31	...	.31
97%, tks ..... gal.	...	.32	...	.32	...	.32
Methyl Acetate, tech, tks, delv ..... lb.	...	.06	.06	.06½	...	.06½
55 gal drs, delv ..... lb.	.07	.08	.07	.08	.07½	.08
C.P. 97-99%, tks, delv lb.	...	.06¼	...	.06¼	.06¼	.07
55 gal drs, delv ..... lb.	.07¼	.07¾	.07¼	.07¾	.07¼	.08½
Acetone, frt all'd, drs gal. *p*	.41	.44	.30	.44	.30	.40½
tks, frt all'd, drs . . gal. *p*	...	.35	.25	.35	.25	.32½
Synthetic, frt all'd, east of Rocky M., drs ..... gal. *p*	.38	.41	.38	.41	.38	.51
tks, frt all'd . . . gal.	...	.31½	...	.31½	.31½	.39½
West of Rocky M., frt all'd, drs . . gal. *p*	...	.42	...	.42	.42	.46
tks, frt all'd . . . gal. *p*	...	.35	...	.35	.35	.39½
Anthraquinone ..... lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ..... lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots, frt allowed ..... lb.	...	.70	...	...	...	...
less than 100 lbs, f.o.b. wks ..... lb.	...	.75	...	...	...	...
Chloride, 90 lb cyl ..... lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.05½	.05	.05½	.05	.06
50 gal drs, frt all'd c-l lb.	.06½	.07	.06	.07	.06	.07
Formate, drs, frt all'd . . lb.	...	.39	.35	.39	.35	.36
Hexyl Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd . . lb.	...	.30	...	.30	...	.30
Mica, dry grd, bgs, wks . . lb.	...	30.00	...	30.00	30.00	35.00
Michler's Ketone, kgs . . . . lb.	...	2.50	...	2.50	...	2.50
Monoamylamine, c-l,drs,wks lb.	...	.52	...	.52	.52	1.00
l.c.l. drs, wks ..... lb.	...	.55	...	...	...	...
tks, wks ..... lb.	...	.50	...	...	...	...
Monobutylamine, drs, c.l., wks ..... lb.	...	.50	.50	.65	...	.65
l.c.l., wks ..... lb.	...	.53	...	...	...	...
tks, wks ..... lb.	...	.48	...	...	...	...
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks . . . . lb.	...	.65	...	...	...	...
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparaminosulfate, 100 lb drs ..... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, lcl wks ..... lb.	..	.75	...	...	...	...
Myrobalans 25%, liq bbls lb.	...	...	.03¾	.04¼	.03¾	.04¼
50% Solid, 50 lb boxes lb.	...	...	.04¼	.05	.04⅜	.06¼
J1 bgs ..... ton	...	33.50	24.00	50.00	23.50	30.00
J2 bgs ..... ton	...	27.50	19.00	41.00	17.00	22.00
N						
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-white, tks ..... gal.	...	.27	.26	.27	.26	.31
drs, c-l ..... gal.	...	.32	.31	.32	.31	.36
Naphthalene, dom, crude bgs, wks ..... lb.	2.50	2.60	2.25	2.85	2.25	2.85
Imported, cif, bgs . . . lb.	...	...	1.50	1.85	1.40	2.25
Balls, flakes, pks ..... lb.	...	.07½	.06½	.07½	.06½	.08
Balls, ref'd, bbls, wks . . lb.	...	.06¾	.05¾	.06¾	.05¾	.07¼
Flakes, ref'd, bbls, wks lb.	...	.06¾	.05¾	.06¾	.05¾	.07¼
Nickel Carbonate, bbls . . lb.	.36	.37½	.36	.37½	.36	.37½
Chloride, bbls ..... lb.	.18	.20	.18	.20	.18	.20
Metal ingot ..... lb.	...	.35	...	.35	...	.35
Oxide, 100 lb kgs, NY lb.	.35	.37	.35	.37	.35	.37
Salt, 400 lb bbls, NY . lb.	.13	.13½	.13	.13½	.13	.13½
Single, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, 40%, drs, sulfate, 55 lb drs ..... lb.	...	.70	.70	.76	...	.76
Nitre Cake, blk ..... ton	...	16.00	...	16.00	...	16.00
Nitrobenzene, redistilled, 1000 lb drs, wks ..... lb.	.08	.10	.08	.10	.08	.10
tks ..... lb.		.07	.07	.07½	...	.07½
Nitrocellulose, c-l, l-c-l, wks lb.	.22	.29	.22	.29	.22	.29
Nitrogen Sol. 45½% ammon., f.o.b. Atlantic & Gulf ports. tks, unit ton, N basis	...	1.2158	...	...	...	...
Nitrogenous Mat'l, bgs, imp unit	...	2.85	2.25	2.85	2.35	2.65
dom, Eastern wks . . . unit	...	2.90	2.30	3.00	2.50	2.75
dom, Western wks . . . unit	...	2.25	1.90	2.25	2.20	2.35
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs . . . . lb.	...	.23	.22	.23	.23	.23

s Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones. Also see footnote directly above; *q* Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Oak Bark Extract, 25%, bbls lb.	.03⅛	.03⅛	.03⅛	.03½	...	.03⅛
tks ... lb.	...	.02¾	.	.02¾	.	.02¾
Octyl Acetate, tks, wks ... lb.	...	.15	.15	.17	.16	.17
Orange-Mineral, 1100 lb cks NY ... lb.	...	.10¾	.10¼	.10¾	.09½	.10½
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	.70	.74	.70	.74	.70	.74
Orthochlorophenol, drs ... lb.	...	.32	...	.32	.32	.75
Orthocresol, 30.4°, drs, wks lb.	.14½	.15	.14½	.17½	.13½	.17½
Orthodichlorobenzene, 1000 lb drs ... lb.	.06	.07	.06	.07	.06	.07
Orthonitrochlorobenzene, 1200 lb drs, wks ... lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins ... lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs ... lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs. wks ... lb.	...	.09	.08	.10	.08	.10
Orthotoluidine, 350 lb bbls, l-c-l ... lb.	...	.19	.16	.19	16	.17
Osage Orange, cryst, bbls lb.	.19	.25	.17	.25	.17	.25
51° liquid ... lb.	...	.09	.07	.09	.07	.08
P						
Paraffin, rfd, 200 lb bgs						
122-127° M P ... lb.	.066	.0675	.03¾	.0675	.03¾	.04½
128-132° M P ... lb.	.068	.0705	.04	.0705	.04	.049
133-137° M P ... lb.	.073	.0755	.0465	.0755	.0465	.05¾
Para aldehyde, 99%, tech, 110-55 gal drs, wks lb.	.10	.11¼	.10	.16*	.16*	.18*
Aminoacetanilid, 100 lb kgs ... lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs ... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	..	1.05
Chlorophenol, drs ... lb.	.30	.45	.30	.45	.30	.45
Dichlorobenzene, 200 lb drs, wks ... lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks lb.	.34	.35	.34	.35	.34	.35
Nitroacetanilid, 300 lb bbls ... lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks ... lb.	.45	.47	.45	.47	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks ... lb.	.15	.16	.15	.16	.15	.16
Nitro-orthotoluidine, 300 lb bbls ... lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	.35	.37	.35	.37	.35	.37
Nitrosodimethylaniline, 120 lb bbls ... lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	.30	.35	...	.35
Phenylenediamine, 350 lb bbls ... lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls. ... lb.	.70	.75	.70	.75	.70	.75
tks, wks ... lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks ... lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks ... lb.	.48	.50	.48	.58	.56	.58
Paris Green, dealers, drs lb.	.23	.26	.23	.26	.23	.26½
Pentane, normal, 28-38° C, group 3, tks ... gal.	...	.08½	...	.08½	...	.08½
drs, group 3 ... gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 100 lb drs, frt all'd ... lb.	.08	.08¾	.08	.10½	...	.10½
Petrolatum, dark amber, bbls ... lb.	.04	.05	.02⅝	.05	.02⅝	.03⅞
White, lily, bbls ... lb.	.07	.08½	.05¼	.08½	.05¼	.07⅛
White, snow, bbls ... lb.	.08	.09½	.06¼	.09½	.06¼	.08½
Petroleum Ether, 30-60°, group 3, tks ... gal.	...	.13½	.13	.13½	...	.13
drs, group 3 ... gal.	.14½	.25½	.14	.25½	.14	.17
PETROLEUM SOLVENTS AND DILUENTS						
Cleaners naphthas, group 3, tks, wks ... gal.	.06⅞	.07	.06⅜	.07	.06⅜	.07⅜
East Coast, tks, wks gal.	.09	.10½	.09	.10	...	.10
Hydrogenated, naphthas, frt all'd East, tks ... gal.	...	.16	...	.16	...	.16
No. 2, tks ... gal.	...	.18	...	.18	...	.18
No. 3, tks ... gal.	...	.16	...	.16	...	.16
No. 4, tks ... gal.	...	.18	...	.18	...	.18
Lacquer diluents, tks, East Coast ... gal.	.09½	.10	.09	.12½	.12	.12½
Group 3, tks ... gal.	.07⅞	.08	.07⅜	.08	.07⅜	.08⅜
Naphtha, V.M.P., East, tks wks ... gal.	...	.09½	.09	.10	.09½	.10
Group 3, tks, wks ... gal.	.06⅞	.07	.06⅜	.07	.06⅜	.07⅜
Petroleum thinner, 43-47, East, tks, wks ... gal.	.08¾	.09½	.08½	.10	.09½	.10
Group 3, tks, wks ... gal.	.05⅞	.06	.05⅜	.06	.05⅜	.06⅜
Rubber Solvents, stand grd. East, tks, wks ... gal.	...	.09½	.09	.10	.09½	.10
Group 3 tks, wks ... gal.	.06⅞	.07	.06⅜	.07	.06⅜	.07⅜
Stoddard Solvent, East, tks, wks ... gal.	.08¾	.09½	.08½	.10	.08½	.10
Group 3, tks, wks ... gal.	.06⅜	.06½	.05⅞	.06½	.05⅞	.06⅞
Phenol, 250-100 lb drs ... lb.	.13	.14¾	.13	.15½	.14½	.15½
tks, wks ... lb.	...	.12	.12	.13½	...	.13½
Phenyl-Alpha-Naphthylamine, 100 lb kgs ... lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs ... lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com ... lb.	...	1.50	...	1.50	...	1.50

* These prices were on a delivered basis.

Current

Phloroglucinol
Rosin Oil

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Phloroglucinol, tech, tins . . lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tins . . . . lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines						
Florida Pebble, 68% basis ton	. . .	1.85	. . .	1.85	. . .	1.85
70% basis . . . . ton	. . .	2.35	. . .	2.35	. . .	2.35
72% basis . . . . ton	. . .	2.85	. . .	2.85	. . .	2.85
75-74% basis . . . . ton	. . .	3.85	. . .	3.85	. . .	3.85
75% basis . . . . ton	. . .	5.50	. . .	5.50	. . .	5.50
Tennessee, 72% basis . . ton	. . .	4.50	. . .	4.50	. . .	4.50
Phosphorus Oxychloride 175						
lb cyl . . . . lb.	.16	.20	.16	.20	.16	.20
Red, 110 lb cases . . . . . lb.	40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs . . lb.	.38	.44	.38	.44	.38	.44
Trichloride, cyl . . . . lb.	.15	.18	.15	.18	.15	.18
Yellow, 110 lb cs, wks . lb.	.24	.30	.24	.30	.24	.30
Phthalic Anhydride, 100 lb						
drs, wks . . . . lb.	. . .	.14½	. . .	.14½	. . .	.14½
Pine Oil, 55 gal drs or bbls						
Destructive dist . . . . lb.	46	.48	.46	.48	.46	.55
Steam dist wat wh bbls gal.	. . .	.59	. . .	.59	. . .	.59
tks . . . . gal.	. . .	.54		.54	. . .	.54
Pitch Hardw'd, dlvd, Akron ton	23.75	.24.00	23.75	24.00	. . .	. . .
Coaltar, bbls, wks . . . . ton	. . .	19.00	. . .	19.00	. . .	19.00
Burgundy, dom, bbls, wks lb.	.05½	.06½	.05½	.06½	.05½	.06½
Imported . . . . lb.	.15	.16	.15	.16	.15	.16
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls . . . . bbl.	6.00	6.25	6.00	6.25	5.75	6.25
Stearin, drs . . . . lb.	.03	.04½	.03	.04½	.03	.04½
Platinum, ref'd . . . . oz.	38.00	40.00	32.00	40.00	30.00	39.00
POTASH						
Potash, Caustic, wks, sol . . lb.	.06¼	.06½	.06¼	.06½	.06¼	.06½
flake . . . . lb.	.07	.07⅜	.07	.07⅜	.07	.07⅜
Liquid, tks . . . . lb.	. . .	.02⅞	. . .	.02⅞	. . .	.02⅞
Manure Salts, imported						
30% basis, blk . . . . unit	. . .	.58½	. . .	.58½	. . .	.58½
Potassium Abietate, bbls . . lb.	. . .	.09	. . .	.09	.08	.13
Acetate, tech, bbls, delv lb.	. . .	.26	. . .	.26	.26	.28
Bicarbonate, USP, 320 lb						
bbls . . . . lb.	. . .	.18	. . .	.18	. . .	.18
Bichromate Crystals, 725						
lb cks* . . . . lb.	.08¾	.09¼	.08¾	.09¼	.08¾	.09¼
Binoxalate, 300 lb bbls . . lb.	. . .	.23	. . .	.23	. . .	.23
Bisulfate, 100 lb kgs . . . . lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800						
lb cks . . . . lb.	.06½	.07	.06½	.07	.06½	.07
liquid, tks . . . . lb.	. . .	.02⅞	. . .	.02⅞	. . .	.02⅞
drs, wks . . . . lb.	.03	.03½	.03	.03½	.03	.03½
Chlorate crys, 112 lb kgs,						
wks . . . . lb.	.10½	.13	.09¼	.13	.09¼	.09½
gran, kgs . . . . lb.	.12	.14½	.12.	.14½	.12	.13
powd, kgs . . . . lb.	.10	.12½	.08½	.12½	.08½	.08¾
Chloride, crys, bbls . . . . lb.	.04	.04¾	.04	.04¾	.04	.04¾
Chromate, kgs . . . . lb.	.19	.28	.19	.28	.19	.28
Cyanide, 110 lb cases . . . lb.	.50	.55	.50	.55	.50	.57½
Iodide, 250 lb bbls . . . . lb.	. . .	1.35	1.13	1.35	.93	1.13
Metabisulfite, 300 lb bbls lb.	.18	nom.	.11	.18	.12	.15
Muriate, bgs, dom, blk unit	. . .	.53½	. . .	.53½	. . .	.53½
Oxalate, bbls . . . . lb.	.25	.26	.25	.26	.25	.26
Perchlorate, kgs, wks . . . lb.	.09	.10½	.09	.10½	.09	.11½
Permanganate, USP, crys,						
500 & 1000 lb drs, wks lb.	.18½	.19½	.18½	.19½	.18½	.19½
Prussiate, red, bbls . . . . lb.	.38	.45	.30½	.45	.30½	.37
Yellow, bbls . . . . lb.	.15	.16	.14	.16	.15	.16
Sulfate, 90% basis, bgs ton	. . .	36.25	36.25	38.00	. . .	38.00
Titanium Oxalate, 200 lb						
bbls . . . . lb.	.40	.45	.35	.45	.35	.40
Pot & Mag Sulfate, 48% basis						
bgs . . . . ton	. . .	24.75	24.75	25.75	. . .	25.75
Propane, group 3, tks . . . . lb.	.03	.04⅜	.03	.04⅜	.03	.04⅜
Putty, coml, tubs . . . 100 lb.	. . .	6.00	3.00	6.00	2.25	3.00
Linseed Oil, kgs . . . . 100 lb.	. . .	4.50	. . .	4.50	4.00	4.65
Pyrethrum, conc liq:						
2.4% pyrethrins, drs, frt						
all'd . . . . gal.	7.15	7.50	5.75	7.50	5.00	6.75
3.6% pyrethrins, drs, frt						
all'd . . . . gal.	10.65	11.00	8.45	11.00	7.65	9.95
Flowers, coarse, Japan,						
bgs . . . . lb.	.33	.36	.26	.36	.18	.28½
Fine powd, bbls . . . . . lb.	.35	.37	.27	.37	.19	.30
Pyridine, denat, 50 gal drs gal.	. . .	1.71	1.63	1.71	1.53	1.63
Refined, drs . . . . lb.	. . .	.51	.50	.51	.45	.50
Pyrites, Spanish cif Atlantic						
ports, blk . . . . unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.75	2.15	2.75	2.15	2.75
Q						
Quebracho, 35% liq tks . . lb.	. . .	.03¼	.02⅞	.03⅜	.03	.03⅜
450 lb bbls, c-l . . . . . . lb.	. . .	.03¾	.04	.04⅛	.03½	.04⅛
Solid, 63%, 100 lb bales						
cif . . . . lb.	. . .	.04½	.04	.04½	. . .	.04
Clarified, 64%, bales . . lb.	. . .	.04¾	.04¼	.04¾	. . .	.04¼
Quercitron, 51 deg liq, 450 lb						
bbls . . . . lb	.07½	.08½	.07½	.08½	.06	.08½
Solid, drs . . . . lb.	.10	.12	.10	.12	.10	.12
R						
R Salt, 250 lb bbls, wks . lb.	.52	.55	.52	.55	.52	.55
Resorcinol tech, cans . . . . lb.	.75	.80	.75	.80	.75	.80
Rochelle Salt, cryst . . . . . lb.	.20¾	.21¼	.17¾	.21¼	.15	.18¼
Powd, bbls . . . . lb.	.19¾	.20¼	.16¾	.20¼	.16	.18½
Rosin Oil, bbls, first run gal.	.45	.47	.45	.47	.45	.60
Second run . . . . gal.	.47	.49	.47	.49	.47	.62
Third run, drs . . . . gal.	.51	.53	.51	.53	.51	.66

* Spot price is ⅛c higher.

Prices

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Rosins 600 lb bbls, 280 lb unit ex. yard NY:***						
B	...	5.45	4.60	5.45	4.65	6.00
D	...	5.55	4.95	5.70	4.75	6.00
E	...	6.25	5.20	6.40	4.90	6.00
F	...	6.30	5.50	6.75	5.05	7.00
G	...	6.50	5.75	7.00	5.25	7.05
H	...	6.70	5.75	7.10	5.25	7.15
I	...	6.75	5.77½	7.20	5.25	7.15
K	...	6.85	5.80	7.20	5.25	7.25
M	...	6.95	5.90	7.25	5.25	7.40
N	...	6.95	6.75	7.40	6.20	7.50
WG	...	7.05	6.95	7.70	6.75	8.45
WW	...	7.60	7.45	8.50	7.55	9.15
Rosins, Gum, Savannah (280 lb unit):**						
B	...	4.00	3.25	4.00	3.25	4.60
D	...	4.10	3.55	4.30	3.50	4.60
E	...	4.82½	3.80	5.00	3.55	4.60
F	...	4.90	4.00	5.35	3.90	5.60
G	...	5.10	4.40	5.70	4.20	5.75
H	...	5.27½	4.40	5.70	4.20	5.75
I	...	5.35	4.40	5.80	4.20	5.85
K	...	5.45	4.40	5.80	4.20	6.00
M	...	5.55	4.40	5.85	4.20	6.15
N	...	5.55	5.10	6.00	4.80	6.20
WG	...	5.65	5.60	6.30	5.40	7.05
WW	...	6.20	5.60	7.10	6.10	7.75
X	...	6.20	6.05	7.10	6.10	7.75
Rosin, Wood, c-l, FF grade, NY	4.60	6.25	5.35	6.80	5.05	6.40
Rotten Stone, bgs mines . . ton	25.50	37.50	22.50	37.50	22.50	35.00
Imported, lump, bbls . . lb.	.14	nom.	...	.14	.12	.14
Powdered, bbls . . . . . . lb.	.08½	.10	.08½	.10	.08½	.10
S						
Sago Flour, 150 lb bgs . . . lb.	.04	.04½	.02½	.04½	.02½	.03¾
Sal Soda, bbls, wks . . . 100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, wks ton	20.00	25.00	19.00	25.00	19.00	23.00
Chrome, c-l, wks . . . . . ton	11.00	12.00	11.00	12.00	11.00	12.00
Saltpetre, gran, 450-500 lb bbls . . . . lb.	.06½	.069	.06½	.069	.06½	.069
Cryst, bbls . . . . lb.	.07½	.0865	.07½	.0865	.07½	.0865
Powd, bbls . . . . lb.	.07½	.079	.07½	.079	.07½	.079
Satin, White, pulp, 550 lb bbls . . . . lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs . . . . . lb.	.46	.48	.46	.48	.46	.48
Shellac, Bone dry, bbls . . lb. r	.25	.26	.18	.26	.16½	.20
Garnet, bgs . . . . lb.	.19	.20	.12½	.20	.12½	.15
Superfine, bgs . . . . lb. s	.20	.21	.10	.21	.11	.13½
T. N., bgs . . . . lb. s	.19	.20	.09½	.20	.10½	.12½
Silver Nitrate, vials . . . . . oz.	...	.26⅞	.26⅞	.33½	.33½	.34⅞
Slate Flour, bgs, wks . . . ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks . . . . 100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs . . . . . 100 lb.	...	1.08	...	1.08	...	1.08
blk . . . . 100 lb.	...	.90	...	.90	...	.90
paper bgs . . . . 100 lb.	...	1.05	...	1.05	...	1.05
bbls . . . . 100 lb.	...	1.35	...	1.35	...	1.35
Caustic, 76% grnd & flake, drs . . . . 100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs . . . . 100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks . . 100 lb.	...	1.97½	...	1.97½	...	1.97½
Sodium Abietate, drs . . . . lb.	...	.11	...	.11	.10	.13
Acetate, 60% tech, gran, powd, flake, 450 lb bbls wks . . . . lb.	.04	.05	.04	.05	.04	.05
anhyd, drs, delv . . . . . lb.	...	.08¼	...	.08¼	...	.08¼
Alginate, drs . . . . lb.	.71	.95	.70	.95	.69	.70
Antimoniate, bbls . . . . . . lb.	.15	.15½	.11½	.16	.12	.15¼
Arsenate, drs . . . . lb.	.08	.08½	.08	.08½	.08	.08½
Arsenite, liq, drs . . . . . gal.	...	.35	.30	.35	.30	.33
Dry, gray, drs, wks . . lb.	.07½	.09½	.07½	.09½	.07½	.09½
Benzoate, USP kgs . . . lb.	.46	.48	.46	.48	.46	.48
Bicarb, powd, 400 lb bbl, wks . . . . 100 lb.	...	1.85	...	1.85	...	1.85
Bichromate, 500 lb cks, wks*	.06¾	.07¼	.06¾	.07¼	.06¾	.07¼
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.031	.036	.03	.036
35-40% sol bbls, wks 100 lb.	1.40	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks . . . . . lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
Cyanide, 96-98%, 100 & 250 lb drs, wks . . . . . lb.	.14	.15	.14	.15	.14	.17½
Diacetate, 33-35% acid, bbls, lcl, delv . . . . . . lb.	...	.09	...	.09	...	.09
Fluoride, white 90%, 300 lb. bbls, wks . . . . lb.	.07	.08	.07	.08¾	.07½	.08¼
Hydrosulfite, 200 lb bbls, f.o.b. wks . . . . lb.	.16	.17	.16	.17	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	...	2.80	...	2.80	2.50	2.80
Tech, reg cryst, 375 lb bbls, wks . . . . . . 100 lb.	2.45	2.80	2.45	2.80	2.40	2.80
Iodide, jars . . . . lb.	...	2.30	2.10	2.30	1.90	2.10
Metal, drs, 280 lbs . . . . lb.	...	.19	...	.19	...	.19
Metanilate, 150 lb bbls . . lb.	.41	.42	.41	.42	.41	.42
Metasilicate, gran, c-l, wks . . . . 100 lb.	...	2.35	2.20	2.35	2.15	2.20
cryst, drs, c-l, wks 100 lb.	...	3.05	2.90	3.05	2.75	2.90
Monohydrated, bbls . . . . lb.	...	.023	...	.023	...	.023
Naphthenate, drs . . . . lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	.50	.54	.52	.54
Nitrate, 92%, crude, 200 lb bgs, c-l, NY . . . . ton	...	28.30	...	28.30	...	28.30
100 lb bgs . . . . ton	...	29.00	...	29.00	...	29.00
Bulk . . . . ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls . . . lb.	.06¾	.11½	.06¾	.11½	.06¾	.11½

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. * Spot price is ⅛c higher. ** Dec. 30. *** Dec. 31.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Sodium (continued):						
Orthochlorotoluene, sulfonate, 175 lb bbls, wks . . lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c.l. . . . . lb.	. . .	2.90	2.90	2.90	2.90	2.90
Perborate, drs, 400 lbs . . lb.	.14¾	.15¼	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb . . lb.	. . .	.17	. . .	.17	. . .	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	. . .	2.30	2.05	2.30	. . .	2.05
bgs, wks . . . . . . 100 lb.	. . .	2.10	1.85	2.10	. . .	1.85
Tri-sodium, tech, 325 lb bbls, wks . . . . . . 100 lb.	. . .	2.45	2.20	2.45	. . .	2.20
bgs, wks . . . . . . 100 lb.	. . .	2.25	2.00	2.25	. . .	2.00
Picramate, 160 lb kgs . . lb.	.65	.67	.65	.67	.65	.67
Prussiate, Yellow, 350 lb bbl, wks . . . . . lb.	.09½	.09¾	.09½	.10¾	.09	.11½
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	. . .	.0530	. . .	.0530	.0530	.10
Sesquisilicate, drs, c-l, wks . . . . . 100 lb.	. . .	2.90	2.80	2.90	2.80	3.00
Silicate, 60°, 55 gal drs, wks . . . . . 100 lb.	1.65	1.70	1.65	1.70	1.65	1.70
40°, 55 gal drs, wks 100 lb.	. . .	.80	. . .	.80	. . .	.80
tks, wks . . . . . 100 lb.	. . .	.65	. . .	.65	. . .	.65
Silicofluoride, 450 lb bbls NY . . . . . lb.	no prices		.03½	.04¾	.04¾	.06½
Stannate, 100 lb drs . . . lb.	. . .	.33½	.30	.35	.25½	.34
Stearate, bbls . . . . . lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate Anhyd, 550 lb bgs* c-l, wks . . . . . 100 lb. ‡	1.45	1.90	1.45	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb bbls, wks . . . . . lb.	. . .	.02½	.02¼	.02½	. . .	.02¼
Solid, 650 lb drs, c-l, wks . . . . . lb.	. . .	.03¼	.03	.03½	. . .	.03
Sulfite, cryst, 400 lb bbls, wks . . . . . lb.	.023	.02½	.023	.02½	.023	.02½
Sulfocyanide, drs . . . . . lb.	.28	.47	.28	.47	.28	.47
Sulforicinoleate, bbls . . . lb.	. . .	.12	. . .	.12	. . .	.12
Tungstate, tech, crys, kgs lb.	no prices		1.05	1.10	1.05	1.35
Sorbitol, com, solut, wks c-l, drs, wks . . . . . lb.	. . .	.15½	. . .	.15½	.15½	.19
Spruce Extract, ord, tks . . lb.	. . .	.01⅛	. . .	.01⅛	. . .	.01⅛
Ordinary, bbls . . . . lb.	. . .	.01⅝	. . .	.01⅝	. . .	.01⅝
Super spruce ext, tks . . lb.	. . .	.01⅜	. . .	.01⅜	. . .	.01⅜
Super spruce ext, bbls . . lb.	. . .	.01⅞	. . .	.01⅞	. . .	.01⅞
Super spruce ext, powd, bgs . . . . . lb.	. . .	.04	. . .	.04	. . .	.04
Starch, Pearl, 140 lb bgs 100 lb.	. . .	2.50	2.40	2.85	2.40	3.18
Powd, 140 lb bgs . . 100 lb.	. . .	2.60	2.50	2.90	2.50	3.28
Potato, 200 lb bgs . . . . . lb.	.06	.06¾	.04	.06¾	.03½	.05½
Imp, bgs . . . . . lb.	.06½	nom.	.05	.06½	.05	.06
Rice, 200 lb bbls . . . . . lb.	.07¼	nom.	.06¼	.07¼	.06¼	.07¼
Sweet Potato, 240 lb bbls, f.o.b. plant . . . . . 100 lb.	5.50	6.00	5.50	7.50	. . .	. . .
Wheat, thick, bgs . . . . . lb.	.05½	nom.	.05	.05½	.06¼	.07
Strontium carbonate, 600 lb bbls, wks . . . . . lb.	.24	nom.	.16	.24	.16½	.17
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¼	.07¾	.08¼	.07¾	.09¼
Sucrose octa-acetate, den, grd, bbls, wks . . . . . lb.	. . .	.45	. . .	.45	. . .	.45
tech, bbls, wks . . . . . lb.	. . .	.40	. . .	.40	. . .	.40
Sulfur, crude, f.o.b. mines ton	. . .	16.00	. . .	16.00	16.00	19.00
Flour, coml, bgs . . . 100 lb.	1.65	2.35	1.65	2.35	1.65	2.35
bbls . . . . . 100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs . . 100 lb.	2.20	2.80	2.20	2.80	2.20	2.80
bbls . . . . . 100 lb.	2.55	3.15	2.55	3.15	2.55	3.15
Extra fine, bgs . . . . 100 lb.	2.85	3.00	2.85	3.00	2.85	3.00
Superfine, bgs . . . . . 100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls . . . . . 100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs . . . . . 100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls . . . . . 100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs . . . . . 100 lb.	2.35	3.10	2.35	3.10	2.35	3.10
bbls . . . . . 100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, 700 lb drs, wks . . . . . lb.	.03	.04	.03	.04	.03	.04
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks . . . lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks . . . . . lb.	.04	.05	.04	.05	.04	.05
Refrigeration, cyl, wks lb.	.16	.17	.16	.17	.16	.17
Multiple units, wks . . . lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride . . . . . lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd . . . . . ton	85.00	nom.	65.50	85.00	62.00	68.00
Extract, 42°, bbls . . . . lb.	. . .	. . .	.05¼	.06¼	.05¼	.06¼
Superphosphate, 16% bulk, wks . . . . . ton	. . .	9.00	8.00	9.00	8.00	9.00
Run of pile . . . . . ton	. . .	8.50	7.50	8.50	7.50	8.50
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit . . . . . ton	. . .	.70		.70	.70	85
Talc, Crude, 100 lb bgs, NY ton	14.00	15.00	13.00	15.00	13.00	15.00
Ref'd, 100 lb bgs, NY ton	14.00	16.00	14.00	16.00	14.00	16.00
French, 220 lb bgs, NY ton	23.00	30.00	23.00	30.00	23.00	30.00
Ref'd, white, bgs, NY ton	45.00	60.00	45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	64.00	70.00	60.00	70.00	60.00	62.00
Ref'd, white, bgs, NY ton	65.00	70.00	65.00	70.00	65.00	70.00
Tankage Grd, NY . . . unit ¤	. . .	3.25	2.75	3.25	2.50	3.15
Ungrd . . . . . unit ¤	. . .	3.75	2.75	5.00	2.35	3.00
Fert grade, f.o.b. Chgo unit ¤	. . .	3.50	2.50	4.50	2.25	3.00
South American cif unit ¤	. . .	3.80	3.00	4.00	3.00	3.45
Tapioca Flour, high grade, bgs . . . . . lb.	.03	.05	.01¾	.05½	.02	.05½
Tar Acid Oil, 15%, drs . . gal.	.22	.24	.21	.24	.21	.25½
25%, drs . . . . . gal.	.26	.28	.25	.28	.25	.29½
Tar, pine, delv, drs . . . . . gal.	.26	.27	.25	.27	. . .	.26
tks, delv, E. cities . . . . gal.	. . .	.21	.20	.21	. . .	.20
Tartar Emetic, tech, bbls lb.	.34¾	.35	.27¾	.35	.26¾	.28
USP, bbls . . . . . lb.	. . .	.40	.33	.40	.32	.33½
Terpineol, den grade, drs lb.	. . .	.17	. . .	.17	. . .	.17

‡ Bags 15c lower; ¤ + 10; * Bbls. are 20c higher.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachloroethylene, drs, tech lb.	...	.09½	...	.09½	...	.09½
Tetralene, 50 gal drs, wks lb.	.12	.13	.12	.13	.12	.13
Thiocarbanilid, 170 lb bbls lb.	.20	.25	.20	.25	.20	.25
Tin, crystals, 500 lb bbls, wks lb.	.37½	.38	.35½	.39	.31	.36½
Metal, NY ....lb.	.49	nom.	.4520	.60	.3570	.4675
Oxide, 300 lb bbls, wks lb.	...	.52	.50	.54	.44	.50
Tetrachloride, 100 lb drs, wks ....lb.	...	24¾	.23	.32	.18½	.23½
Titanium Dioxide, 300 lb bbls lb.	.13¼	.16	.13¼	.16	.14½	.17
Barium Pigment, bbls..lb.	.05½	.06½	.05⅝	.06½	.05⅝	.06⅛
Calcium Pigment, bbls..lb.	.05½	.06½	.05⅝	.06½	.05⅝	.06⅛
Toluidine, mixed, 900 lb drs, wks ....lb.	.26	.27	.26	.27	.26	.27
Toluol, 110 gal drs, wks..gal.	...	.27	...	.27	.27	.35
8000 gal tks, frt all'd..gal.	...	.22	...	.22	.22	.30
Toner Lithol, red, bbls...lb.	.55	.60	.55	.80	.75	.80
Para, red, bbls ....lb.	.70	.75	.70	.80	.75	.80
Toluidine, bgs ....lb.	...	1.35	...	1.35	...	1.35
Triacetin, 50 gal drs, wks lb.	...	.26	...	.26	...	.36
Triamyl Borate, lcl, drs, wks lb.	...	.27	...	.27	...	.27
Triamylamine, c-l, drs, wks lb.	...	.77	.77	1.25	.77	1.25
lcl, wks, drs, ...lb.	...	.80	...	...	...	...
tks, wks, ...lb.	...	.75	...	...	...	...
Tributylamine, lcl, drs, wks lb.	...	.70	...	.70	...	.70
cl, drs, wks ....lb.	...	.67	...	...	...	...
tks, wks ....lb.	...	.65	...	...	...	...
Tributyl citrate, drs, frt all'd lb.	...	.35	.35	.45	...	.45
Tributyl Phosphate, frt all'd lb.	...	.42	...	.42	.42	.50
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts..lb.	.08	.08¾	.08	.09½	.089	.09½
Tricresyl phosphate, tech, drs lb.	.22	.36½	.22	.37½	.23	.39
Triethanolamine, 50 gal drs wks ....lb.	.21	.22	.21	.22	.21	.22
tks, wks ....lb.	...	.20	...	.20	...	.20
Triethylamine, lcl, drs, f.o.b. wks ....lb.	...	1.05	...	...	...	...
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls ....lb.	...	.30	...	.30	...	.30
Stearate, bbls ....lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl f.o.b. dest ....lb.	...	.50	...	.50	...	.50
Trimethylamine, c-l, drs, frt all'd E. Mississippi ....lb.	...	1.00	...	1.00	...	1.00
Triphenylguanidine ......lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs..lb.	...	.38	...	.38	.34	.38
Tripoli, airfloated, bgs, wks ton	26.00	30.00	26.00	30.00	26.00	30.00
Turpentine (Spirits), c-l, NY dock, bbls ....gal.	...	.33¾**	.29	.35	.26½	.31½
Savannah, bbls ....gal.	...	27¾*	.23½	.29	.20½	.30¾
Jacksonville, bbls .....gal.	...	.26*	.23½	.26¾	.20½	.30¾
Wood Steam dist, drs, c-l, NY ....gal.	.31½	.34	.242	.34	.242	.31
Wood, dest dist, c-l, drs, delv E. cities ......gal.	.23	.25	.22	.25	.22	.36
U						
Urea, pure, 112 lb cases..lb.	.14½	.15½	.14½	.15½	.14½	.15½
Fert grade, bgs, c.i.f...ton						
c.i.f. S.A. points ....ton	95.00	110.00	95.00	110.00	95.00	110.00
Dom. f.o.b., wks ......ton	95.00	101.00	95.00	101.00	95.00	101.00
Urea Ammonia, liq., nitrogen basis .... ton	...	121.58	...	...	...	...
V						
Valonia beard, 42%, tannin bgs ....ton	54.00	nom.	45.00	57.00	45.00	52.00
Cups, 32% tannin, bgs..ton	33.00	37.00	27.00	39.00	30.00	37.50
Extract, powd, 63% ...lb.	.0565	.06	.05	.06	...	.06
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots ....lb.	...	2.60	2.20	2.60	2.10	3.10
Ex-guaiacol ....lb.	...	2.50	2.10	2.50	2.00	3.00
Ex-lignin ....lb.	...	2.50	2.10	2.50	2.00	2.25
Vermilion, English, kgs..lb.	no prices		1.50	2.97	1.45	1.69
W						
Wattle Bark, bgs ....ton	36.50	39.00	34.50	40.00	36.00	41.75
Extract, 60°, tks, bbls..lb.	...	.04¼	.04	.05½	.04⅜	.04⅝
WAXES						
Wax, Bayberry, bgs .....lb.	.28	.30	.16⅞	.39	.16⅞	.17
Bees, bleached, white 500 lb slabs, cases ......lb.	...	.38	.33	.40½	.35	.45
Yellow, African, bgs..lb.	.27	.27¼	.18½	.30	.19	.26
Brazilian, bgs .....lb.	.27	.27½	.21	.33	.22	.29
Refined, 500 lb slabs, cases lb.	.31	.36	.25½	.36	.32	.39
Candelilla, bgs ....lb.	.18½	.19	.15¼	.19	.13½	.16
Carnauba, No. 1, yellow, bgs ....lb.	.76	.78	.36¾	.78	.38	.44
No. 2, yellow, bgs ...lb.	no prices		.35¾	.45	.36	.42
No. 2, N. C., bgs ....lb.	no prices		.34	.41	.34	.40
No. 3, Chalky, bgs...lb.	.45	.46	.27½	.46	.29	.35½
No. 3, N. C., bgs ...lb.	.48	.49	.28¾	.49	.30	.35½
Ceresin, dom, bgs .....lb.	.11½	.15	.08½	.15	.08½	.11½
Japan, 224 lb cases ....lb.	.17	.17½	.09¾	.18	.09¼	.11
Montan, crude, bgs ....lb.	no prices		.11	.11¼	.11	.12⅛
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.24	.25	.18	.25	.22	.24
Cakes, cases ....lb.	.25	.26	.19	.26	.23	.25
Whiting, chalk, com 200 lb bgs c-l, wks ....ton	12.00	14.00	12.00	14.00	12.00	14.00
Gilders, bgs, c-l, wks..ton	...	15.00	...	15.00	...	15.00
Wood Flour, c-l, bgs ...ton	20.00	30.00	20.00	30.00	20.00	33.00
Xylol, frt all'd, East 10° tks, wks ....gal.	...	30	.29	.30	.29	.33
Coml, tks, wks, frt all'd, gal.	...	.27	.26	.27	.26	.30
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Zein, bgs, 1,000 lb lots, wks ....lb.	...	.20	...	...	...	...
Zinc Acetate, tech, bbls, lcl, delv ....lb.	.15	.16	.15	.21	...	.21

* Dec. 30. ** Dec. 31.

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Zinc (continued):						
Arsenite, bgs, frt all'd . lb.	.12	.12½	.12	.13	.12½	.13
Carbonate tech, bbls, NY lb.	.14	.15	.14	.15	.14	.15
Chloride fused, 600 lb drs, wks .... lb.	.04¼	.046	.04¼	.046	.04¼	.046
Gran, 500 lb drs, wks lb.	.05	.05¾	.05	.05¾	.05	.05¾
Soln 50%, tks, wks 100 lb.	...	2.25	...	2.25		2.25
Cyanide, 100 lb drs.... lb.	...	.33	...	.33	.33	.38
Dust, 500 lb bbls, c-l, delv lb.	...	.08	.06½	.08½	.06	.0740
Metal, high grade slabs, c-l, NY .... 100 lb.	...	6.40	4.84	6.40	4.35	5.45
E. St. Louis ..... 100 lb.	...	6.00	4.60	6.00	4.00	5.05
Oxide, Amer, bgs, wks . lb.	.06¼	.07½	.06¼	.07½	.06	.07½
French 300 lb bbls, wks lb.	.06½	.07¾	.06½	.07¾	.06¼	.07¾
Palmitate, bbls .... lb.	.23	.25	.23	.25	.23	.25
Resinate, fused, pale bbls lb.	...	.10	...	.10		.10
Stearate, 50 lb bbls .... lb.	.21½	.24½	.20	.24½	.20	.23
Zinc Sulfate, crys, 400 lb bbl, wks .... lb.	...	.029	...	.029	.029	.033
Flake, bbls .... lb.	...	.0325	...	.0325	.0325	.0375
Sulfide, 500 lb bbls, delv lb.	.07¾	.08	.07¾	.08⅞	.08⅝	.09¾
bgs, delv .... lb.	.07½	.07¾	.07½	.08⅝	.08⅜	.09
Sulfocarbolate, 100 lb kgs lb.	.24	.26	.24	.26	.24	.26
Zirconium Oxide, crude, 73-75% grd, bbls, wks ...... ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

	Current Market		1939 Low	1939 High	1938 Low	1938 High
Babassu, tks, futures ... lb.	...	.06⅝	.05⅞	.07⅝	.06⅛	.06¾
Castor, No. 3, 400 lb drs lb.	.12¾	nom.	.08¼	.12¾	.09¼	.10¾
Blown, 400 lb drs .... lb.	.14¾	nom.	.10¼	.14¾	.11¼	.13
China Wood, drs, spot NY lb.	.26½	.28	.15	.28	.10¼	.15½
Tks, spot NY .... lb.	.25½	.27	.14½	.27	.095	.15½
Coconut, edible, drs NY . lb.	.08⅞	.09	.08⅛	.10⅛	.08⅛	.09½
Manila, tks, NY ...... lb.	...	.03⅝	.02⅞	.04⅝	.03⅛	.04¼
Tks, Pacific Coast ... lb.	...	.03½	.02⅝	.04⅜	.02⅝	.03¾
Cod, Newfoundland, 50 gal bbls .... gal.	.72	nom.	.29	.72	.35	.52
Copra, bgs, NY .... lb.	...	.0250	.0160	.2625	.0170	.0235
Corn, crude, tks, mills ... lb.	.06¼	.06½	.05⅛	.07⅛	.06⅜	.08¼
Refd, 375 lb bbls, NY . lb.	.08¾	.09	.07½	.09¾	.09¼	.10½
Degras, American, 50 gal bbls NY .... lb.	.09½	.10	.07	.10	.07½	.08¼
English, bbls, NY ..... lb.	.09½	nom.	.07	.10	.07½	.08¼
Greases, Yellow .... lb.	.05¼	.05½	.03⅞	.06¾	.03½	.05½
White, choice, bbls, NY lb.	.05⅝	.06	.04½	.07½	.05	.07
Lard, Oil, edible, prime . lb.	...	.10	.09	.11¼	.10¼	.12¾
Extra, bbls .... lb.	...	.09⅜	.08	.10⅜	.08¾	.10¾
Extra, No. 1, bbls ..... lb.	...	.09¼	.07¾	.10⅛	.08⅝	.09¾
Linseed, Raw less than 5 bbl lots .... lb.	.116	.119	.092	.119	.089	.115
bbls, c-l, spot .... lb.	.108	.111	.084	.111	.081	.102
Tks .... lb.	.102	.104	.078	.104	.07½	.096
Menhaden, tks, Baltimore gal	.34	nom.	.21	.35	.34½	.37½
Refined, alkali, drs .... lb.	...	.079	.062	.082	.067	.095
Tks .... lb.	...	.073	.056	.076	.061	.087
Kettle bodied, drs .... lb.	...	.091	.074	.094	.076	.105
Light pressed, drs ..... lb	...	.073	.056	.076	.061	.091
Tks .... lb.	...	.067	.05	.07	.05½	.08
Neatsfoot, CT, 20°, bbls, NY lb.	...	.19¼	.14¾	.19¾	.15¼	.17¼
Extra, bbls, NY .... lb.	...	.09¼	.08	.10⅛	.08⅝	.10
Pure, bbls, NY .... lb.	...	.14¾	.10¾	.16¾	.10¾	.12¼
Oiticica, bbls .... lb	.20	.21	.09¼	.21	.09¼	.12¾
Oleo, No. 1, bbls, NY ... lb	...	.08	.07¼	.12	.08½	.10½
No. 2, bbls, NY ...... lb.	...	.07¾	.06¾	.11¾	.08	.10
Olive, denat, bbls, NY . gal.	1.00	1.05	.82	1.40	.86	1.20
Edible, bbls, NY .... gal.	2.00	2.15	1.75	2.25	1.75	2.35
Foots, bbls, NY ...... lb.	.08½	.08¾	.06¾	.10	.07	.09⅞
Palm, Kernel, bulk ..... lb.	no prices		.0340	.036	.0325	.04½
Niger, cks .... lb.	...	.05	.03⅝	.05		
Sumatra, tks .... lb.	no prices		.0265	.02¾	.02⅝	.0375
Peanut, crude, bbls, NY . lb.	...	.07	.06	.08	.07	.08¼
Tks, f.o.b. mill .... lb	.06¾	.07	.05¼	.07¼	.06⅝	.08
Refined, bbls, NY lb.	.09½	.09¾	.08¾	.10¾	.09¾	.10¾
Perilla, drs, NY .... lb	.16	.16½	.09½	.16½	.09¾	.11¾
Tks, Coast .... lb	.15½	.15¾	.089	.15¾	.09	.11
Pine, see Pine Oil, Chemical Section.						
Rapeseed, blown, bbls, NY lb.	.17	.17½	.14	.17½	.14	.14¾
Denatured, drs, NY . gal	1.00	1.05	.80	1.05	.75	.91
Red, Distilled, bbls ...... lb.	.08½	.09½	.06¾	.09½	.07⅜	.10⅝
Tks .... lb.	...	.08	.064	.08½	.06½	.09¾
Sardine, Pac Coast, tks . gal	.35	nom.	.24	.38	.28	.46½
Refined alkali, drs ..... lb.	...	.079	.062	.082	.067	.095
Tks .... lb	...	.073	.056	.076	.061	.087
Light pressed, drs ..... lb.	...	.073	.056	.076	.061	.089
Tks .... lb.	...	.067	.05	.07	.05½	.08
Sesame, yellow, dom .... lb.	.12	nom.	.09	.12	.10¼	.10½
White, dom .... lb	.12	nom.	.09	.12	.10¼	.10½
Soy Bean, crude						
Dom, tks, f.o.b. mills . lb	...	.06½	.04½	.06½	.05⅞	.07
Crude, drs, NY ...... lb	.07⅛	.07⅝	.05⅛	.07⅝	.06½	.08
Ref'd, drs, NY .... lb	.08½	.09	.06⅜	.09	.07⅝	.097
Tks .... lb.	...	.07¾	.05¾	.07¾	.0685	.082
Sperm, 38° CT, bleached bbls NY .... lb.	...	.103	.09	.103	.10	.102
45° CT, bleached, bbls, NY .... lb.	...	.096	.083	.096	.093	.095
Stearic Acid, double pressed dist bgs .... lb.	.12	.13	.10	.13½	.10	.12.
Double pressed saponified bgs .... lb.	.12¾	.13¾	.10¼	.13¾	.10¼	.12¼
Triple pressed dist bgs . lb.	.15½	.16½	.12¾	.16½	.13	.15
Stearine, Oleo, bbls ..... lb.	.06¾	.07	.05½	.12	.05½	.08½
Tallow City, extra loose . lb.	.05¾	nom.	.04⅜	.07	.04¾	.06¾
Edible, tierces .... lb.	.06½	nom.	.04½	.07¾	.06	.07⅝
Acidless, tks, NY ..... lb.	...	.08¼	.07	.09¼	.07¾	.09¼
Turkey Red, single, drs .. lb.	.07½	nom.	.06	.08⅝	.06	.08½
Double, bbls .... lb.	.11¼	nom.	.08¾	.11¼	.09¼	.13
Whale:						
Winter bleach, bbls, NY lb.	...	.095	.075	.095	.081	.10
Refined, nat, bbls, NY . lb	...	.091	.071	.091	.077	.096

BOOKLETS AND CATALOGS

Chemicals

Ciba Review, No. 27, presents a short history of the textile trades in Medieval Florence, with many fine and unusual illustrations. Ciba Co., Inc.

The Diatom; cleverly arranged booklet gives salient facts about the functions of diatomaceous minerals produced by the Dicalite Co.

The Drying and Curing of Fruit; handsome folder, in full color, describes proper methods for the sulfuring of fruits in the drying process. San Francisco Sulphur Co.

Enzymes, Gland Substances, Animal Derivatives, a booklet listing over 60 protein derivatives and other glandular extracts, available in bulk quantities, or upon special request. Wilson Labs.

Glycerine and its Derivatives; good-looking handbook on some of the glycerine chlorhydrins, esters, and ethers, as well as reviewing the grades of glycerine now available, and their applications. Glycerine Producers' Association.

Hydrogen Bridges; leaflet, one of the regular series, is devoted to a discussion of the nature of these linkages in various types of organic structures. Eastman Kodak Co.

Jap-Beetle Kit; leaflet announces a new and more potent control for the Japanese Beetle, a combination spray package. Chipman Chemical Co., Inc.

Laboratory Gases; folder lists more than 25 gases available in flasks, including phosgene, helium, vinyl chloride, and other less common compounds. The Matheson Co.

Magnus, Mabee, and Reynard Catalogue; catalogue of this well-known firm's stocks of essential oils, aromatic chemicals, oleoresins, certified colors, flavoring and perfuming materials, and balsams. November-December issue.

Moly-Black; bulletin on the new molybdenum-nickel black electroplating finish. The Du Pont Co.

New Leaflet on Chlorpicrin; cleverly-written folder, illustrated with good cartoons, names several entirely new uses for this familiar insecticide chemical. Innis, Speiden & Co.

Petrohol; 59-page brochure constitutes a complete technical picture of isopropyl alcohol—physical and chemical properties tabulated in greatest detail, applications, bibliography—a very useful manual for the solvents, drug, and cosmetic laboratory. Standard Alcohol Co.

Priorities, December; beautifully designed Christmas issue, devoted to Platinum, and its place in art and industry. Prior Chem. Corp.

Products, Facilities, Service; leaflet announces new hydrazine products and other reagents of C. P. grade. A. E. Rogers Labs, Inc.

Rare Organicals and Vitamin Chemicals; leaflet lists over 100 chemicals ordinarily hard to find at short notice. H. Meyer Drug Co., Inc.

Rhoplex Resins; 5th in the series of folders describing the application of synthetic resin materials to fabrics, yielding very desirable qualities of fullness, clarity, and stability to the texture. Rohm & Haas Co., Inc.

Rotenone Materials; well-planned 4-page folder shows graphically some new processes for dust insecticides based on walnut shell dust. Agicide Labs.

Sulfur from the Mine to the Vine; colorful booklet briefly tells how sulfur is prepared for agricultural use as a dusting powder. San Francisco Sulphur Co.

Seal-Rite Compounds; bulletin calls attention to high-pressure joint sealing preparations quite inert to organic chemicals and corrosives. Macksons Co.

Solvents Derived from Petroleum; booklet describes the essential commercial properties and uses of some of the economical solvents derived from refinery gases. Standard Alcohol Co.

Special Spot Test Reagents; folder is a price list for reagent quantities required for the Feigl rapid analytical techniques. Eastman Kodak Co.

Stannochlor, useful little pamphlet describes a much improved tin chloride, as a superior product to ordinary tin crystals. Prior Chem. Corp.

The Story of Eastman Acetate Rayon; beautifully illustrated pictorial narrative of how acetate rayon is made and woven. An unusual and modern design makes this brochure of special interest. Tennessee Eastman Corp.

Study of the Control of Nickel Catalyst; booklet, a reprint of a paper presented before the A. O. C. A. in Oct., '39, outlines laboratory operating technique relating to the testing of nickel catalysts during the process of preparing them for industrial use. The Rufert Chem. Co.

Tannoid; leaflet announces a new tannic acid treatment for burns, as a first-aid remedy: compound is a water-soluble jelly containing the proper amount of tannic acid, packed in a collapsible tube. Davis Emergency Equipment Co.

Thylox Process for H_2S Removal; folder has a valuable flow-sheet, in color, showing how sulfide gas is removed from wastes by contact with soda-thylox solution. The Koppers Co.

Silicate P's & Q's, November; presents some little-known facts about the function of silicates in reclaiming metallic ores by flotation methods. Provides exclusive information on the literature pertaining to these techniques.

Titanox; profusely illustrated booklet gives some idea of how and where titanium products are used, and how their manufacture is controlled. Titanium Pigment Corp.

Equipment—Containers

Abbé Jar Mills; illustrated brochure presents 7 types of jar mill, as well as several special models for handling bottles and jars, bowl-type mill, etc. Also illustrated are the numerous accessories for mill grinding—jars, grinding media, and the like, as well as mixing and sifting equipment. Abbé Engineering Co.

Alco Folder; illustrated folder shows company's pressure vessels and heat exchangers for large installations in the chemical field. Alco Prods. Div., American Locomotive Co.

Armco Stainless Steels; unusually handsome brochure, fine photographic presentation of apparatus for the paper, dyeing and finishing, and processing industries—each application being especially formulated for the particular purpose. Valuable feature is a 4-page table showing the comparative resistance of certain stainless formulae to over 150 chemical media. American Rolling Mill Co.

Bagology; December number, with handsome cover in holiday spirit, has a back cover somewhat out of the ordinary, too. Chase Bag Co.

Condenser News, December, '39; describes and illustrates numerous laboratory aids in the way of glassware (including a much improved design for 3-necked reaction flasks), ovens, pumps, and scales for general use. Scientific Glass Apparatus Co.

Copper and Copper Alloys; an excellent brochure, fully illustrated, describing the properties and methods of fabrication of copper and its alloys. Outstanding, valuable feature is a complete tabulation of the physical properties of over 40 different alloys of copper. Revere Copper and Brass, Inc.

Corrosion Resistant Chemical Equipment; brochure presents an unusual equipment material, comprising an asbestos base impregnated with synthetic resin of the phenol-formaldehyde type; resultant product is moldable and, because the molds required are light-weight and simple in construction, large castings (usually impracticable or difficult) can be made with ease. Material, called "Haveg" finds application in the chemical, petroleum, and textile industries, being resistant to all but a few chemicals. The Haveg Corp.

Davis First-Aid Catalog; contents include kits for general and special purposes; dressings, treatments, and supplies packed in handy unit cartons; splints, stretchers, and other industrial first-aid equipment. Davis Emergency Equipment Co.

Diactor Regulators, General Electric's automatic instruments for regulating A. C. generator voltages, are described and shown in one of its looseleaf series of equipment data sheets.

Electrical Measuring Instruments; new condensed general guide to all of the regular fine tools manufactured by Leeds & Northrup Electrical Measuring Instruments; new, condensed general catalog of the fine apparatus for industry manufactured by Leeds & Northrup.

A Guide to More Efficient Shipping; good-looking folder illustrating how lined, waterproof bags answer the question of shipping and storing bulk products requiring special protection—such as pulverized natural raw materials, finely-granulated industrial chemicals, etc. Bemis Bag Co.

Gyro-Sifter; Bulletin No. 41-D describes and illustrates in detail a vibratory sifter of expert scientific design available in such varied types as the centrifugal, round, hexagonal, inter-elevator and others of special construction; booklet, one of company's looseleaf series, includes accessory equipment and suggested plant layouts for grading and sorting various kinds of chemical raw materials. Robinson Mfg. Co.

Hewitt Magazine; this Autumn number is informative and newsy; has much of interest on new rubber fabrications for industry. Hewitt Rubber Corp.

The Houghton Line; recent issue of this clever, readable organ of E. F. Houghton & Co.

Infilco Catalog; condensed review of equipment for chemical mixing, feeding and proportioning, for hydraulic measurement and control, and for conditioning water, processing liquids and trade wastes, illustrated profusely. International Filter Co.

The Laboratory; Vol. 11, No. 2 features the new instrument for the magnetic determination of carbon in open-hearth and other steel processes, the "Carbanalyzer." Reviews briefly the development of American iron-making. Fisher Scientific Co.

Little-Known G-E Products for Industry; handsome 20-p. booklet, illustrates a number of precision measuring devices for the laboratory and plant. Of special interest is a glass-strain analyzer, recommended for checking glass-to-metal seals, and the like. G. E.

Moisture Detectors; leaflet briefly describes several models of rugged, compact, and portable electric detectors for checking construction work, whether of wood, concrete, brick, plaster, or other materials. Colloid Equipment Co., Inc.

Neoprene Laboratory Tools; pamphlet illustrates and lists a new line of stoppers and crucible holders made of Neoprene. R. W. Rhoades Metaline Co., Inc.

Patterson Mills, handsome catalogue of pebble and ball mills for bulk and laboratory work in the refining of ceramic and other raw materials for paints, inks, chemical colors, etc. Patterson Foundry & Machine Co.

Pfaudler's Test Pilots; attractively-designed booklet, full of snapshots showing laboratory and plant testing procedures employed in the improvement and production of glass and enamel lined equipment for the chemical and allied industries. The Pfaudler Co.

Polarographic Analysis; handsome brochure explains how this method can be used for determining the common and rare elements, and certain groups, with high accuracy and speed. Sargent.

Potentiometer Recording Pyrometers; a 15-page, well-illustrated booklet providing complete data on these instruments for use in the recording of industrial temperatures. The Foxboro Co.

Resistance of "Ni-Resist" to Corrosion by Sewage; 8-p. folder with data giving relative corrosion rates of metals in waste matter, as well as describing parts that can be satisfactorily constructed of nickel steel. International Nickel Co., Inc.

The Robinson Plan; leaflet describes an all-inclusive auto service that should be of interest to firms whose representatives are on the road most of the time. Robinson Auto Rental Co.

Tag Industrial Thermometers; good-looking brochure, with many photo and diagrammatic illustrations, showing various types of heat-measuring and controlling, and recording, instruments for the process industries. C. J. Tagliabue Mfg. Co.

Tantalum; handsome and beautifully illustrated story of tantalum and its industrial importance. Brochure is written with great care, and will be of interest to chemist and equipment maker alike. Fansteel Metallurgical Corp.

Where Monel Pays Its Way in Pickling; well-illustrated folder showing Monel apparatus in use in pickling operations in the automotive, steel, and container industries, as well as in plating plants. The International Nickel Co., Inc.

"Workshop" Precision Lathes; folder describes, with aid of excellent detail diagrams, a line of bench lathes for the experimental shop or laboratory. South Bend Lathe Works.

Worthington Turbine Well Pumps; handsome folder in full color, shows in detail the features of a new line of pumps for use in bored wells, fitted with vacuum-molded impellers of hard, high-tensile bronze. Worthington Pump and Machinery Corp.

Yale Warehouse and Factory Aids; well illustrated brochure presents a complete line of hand- and electrically-manipulated trucks, including acid, carboy, scale, and high-lift trucks. Other models shown include special types for stockyard duty, crane, ram, and dump trucks. Yale & Towne Mfg. Co.

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Index to Advertisers

Index to Advertisers

"We"—Editorially Speaking

While there are some who will complain that Assistant Attorney-General Thurman Arnold did not go nearly as far as he might or should have in his recent discussion of what labor can but chiefly cannot do, nevertheless, it was refreshing to read that a degree of sanity is returning on the subject of what constitutes the rights of labor.

The word economy is again "popping" into the Washington headlines. But isn't there a presidential election in 1940?

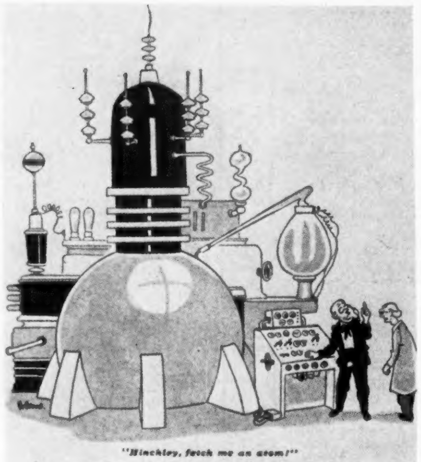
Dr. Charles M. A. Stine, Du Pont vice-president, performed a distinct service when he told the Association of Land-Grant Colleges and Universities recently that, "The dark side of agriculture has received altogether too much emphasis. The resulting picture is one of a decaying industry. It is one that deters many able young people from agricultural careers. It implants the seeds of discontent and defeatism. It undermines morale. And it is a false picture!"

The speaker reported that agriculture spends only about 1/7 of one per cent. of the value of its products on research, compared with the chemical industry which spends between two and four per cent. of its annual gross sales revenue on research. As much as $240,000,000 might be expended annually on agricultural research, and that sum would be only three per cent. of an eight-billion-dollar farm income.

In his recent budget message the President estimated the total outlay for the fiscal year which ends June 30, 1941, at $8,400,000, and the net deficit, unless new taxes are imposed, at $2,176,000. If Congress should adopt his recommendation of raising $460,000,000 in new taxes the deficit will be cut down to $1,716,000. How the new deficit would compare with those of the last ten years is shown below:

1931	$481,000,000
1932	2,529,000,000
1933	1,784,000,000
1934	2,895,000,000
1935	3,210,000,000
1936	4,550,000,000
1937	3,148,000,000
1938	1,384,000,000
1939	3,542,000,000
1940	3,933,000,000

We would suggest that you add up the total—it will be more impressive—then do something about it.



"Hinchley, fetch me an atom!"

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"We" have been accused on more than one occasion in the last few years of being too pessimistic on the employment outlook for the thousands of chemists coming off the college and university "assembly lines." Editorially we have insisted that what industry needed was fewer but better trained technicians. Of more than passing interest to us, therefore, was a recent American Chemical Society release which states that, "Chemistry like all professional fields is overcrowded." Further on we find this:—"It should be emphasized that steady employment is afforded to only the best qualified who achieve excellence by diligent preparation." We commend the Society for preparing the report and suggest that it be given the wide attention it deserves. Particularly it should be placed in the hands of every young man and woman who contemplates chemistry and chemical engineering as a career.

Fifteen Years Ago

From our files of January, 1925

Du Pont to make synthetic ammonia by the Claude process at Clinchfield, Va.

United Carbon Co. is formed, as a merger of 9 Louisiana carbon black producers in the Monroe gas field.

Charles F. Chandler presents the Perkin Medal to Hugh Kelsea Moore at the Chemists' Club (N. Y.) on Jan. 16.

Edward Mallinckrodt, president, Mallinckrodt Chemical Works, is guest of honor at a party in the Bogey Club, N. Y. City, on his 80th birthday.

Butyl Corporation is organized to manufacture butanol, acquiring the Peoria (Ill.) plant of American Milling Co.

Derivation of the word "nylon" was described recently by officials of the Du Pont Company, who said it is a generic word coined by the company and is not a registered name or trademark. They asserted the sequence of letters composing the word has no significance, etymologically or otherwise.

"When the polyamides were developed," said the officials, "it was apparent that no short 'catchy' word existed by which this new group of synthetic materials could be designated. Much thought was accordingly given to the coining of a non-technical, generic name for the polyamides, and some 350 different words were suggested. It was particularly desired to find a simple word—one not likely to be mispronounced.

"Because the names of two textile fibers in common use—namely 'cotton' and 'rayon,' end with the letters 'on', and because it appeared from the beginning that one of the principal outlets for the polyamides would be in the field of textiles, it was felt that a word ending in 'on' might be desirable. A number of words which otherwise seemed suitable were rejected because it was found they were not sufficiently distinct from words found in the dictionary, or in lists of classified trademarks. After much deliberation, the term 'nylon' was finally adopted."

Promptly on January 2 the Bureau of the Census began its work of canvassing for data for the Census of Business. The Biennial Census of Manufacturers is being taken at the same time. Prompt cooperation by industrial executives will be a real contribution toward making a complete, accurate, and rapid enumeration. This, in turn, will enable the Bureau to get the results into industry's hands at the earliest possible date. The data provide business men with the most detailed information obtainable. We are glad to lend our cooperation by asking you to cooperate promptly.

"We" are reminded that, on p. 705 of the December anniversary number, the product "Isophorone" was credited to The Barrett Co. However, "Isophorone" is one of Carbide and Carbon's group of fine chemicals, and not a member of the Barrett series of cyclic ketone solvents. Carbide and Carbon has made "Isophorone" in the past only as a relatively rare chemical, but now offers this unique solvent (for "Vinylite" resins, dyes, lacquers, as well as for fats, oils, gums, and resins generally) for all-round duty in lacquer, ink, and synthetic resin formulations.

State of Chemical Trade

Current Statistics (Dec. 31, 1939)—p. 49

WEEKLY STATISTICS OF BUSINESS

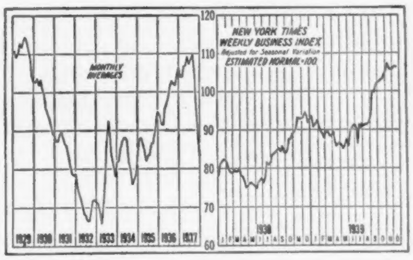
Week Ending	Carloadings 1939	Carloadings 1938	Carloadings % of Change	Electrical Output* 1939	Electrical Output* 1938	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Fertilizer Ass'n Price Indices: Chem. & Drugs	Nat'l Fertilizer Ass'n Price Indices: Fats & Oils	Nat'l Fertilizer Ass'n Price Indices: Fert. Mat.	Nat'l Fertilizer Ass'n Price Indices: Mixed Fert.	Nat'l Fertilizer Ass'n Price Indices: All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
Nov. 18	771,404	657,066	+17.4	2,514,350	2,270,296	+10.7	80.9	93.6	52.8	73.1	77.3	77.2	77.8	94.0	106.1	119.3
Nov. 25	676,516	561,658	+20.4	2,481,882	2,183,807	+13.6	80.7	93.6	50.7	73.2	77.3	77.1	77.4	94.5	105.8	119.0
Dec. *2	688,888	648,534	+ 6.2	2,538,777	2,285,523	+11.1	80.2	93.6	51.5	73.2	77.3	77.0	77.5	92.5	106.2	118.1
Dec. 9	687,265	619,340	+11.0	2,585,560	2,318,550	+11.5	81.2	94.0	53.5	73.5	77.3	77.5	77.6	91.0	106.6	117.8
Dec. 16	681,166	606,003	+12.4	2,604,558	2,332,978	+11.6	81.8	94.0	54.6	73.5	78.2	77.5	77.6	90.0	106.4	117.3

*K.W.H., 000 omitted †1926-1928 = 100.0.

MONTHLY STATISTICS

CHEMICAL:	Nov. 1939	Nov. 1938	Oct. 1939	Oct. 1938	Sept. 1939	Sept. 1938
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	......	......	205,024	161,285	153,897	133,266
Consumpt. in mfr. fert.	......	......	175,338	151,083	134,287	126,974
Stocks end of month	......	......	75,337	90,340	74,113	88,165
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.	21,786,753	15,163,858	20,965,125	17,016,875	18,104,019	15,759,159
Comp. denat. prod., wine gal.	2,838,893	2,826,942	4,906,872	3,723,506	2,101,669	2,602,376
Removed, wine gal.	2,900,234	2,989,276	5,175,243	3,984,655	2,182,218	2,553,002
Stocks end of mo., wine gal.	350,954	433,186	412,987	597,198	685,736	862,733
Spec. denat. prod., wine gal.	10,221,280	7,359,401	10,274,257	7,375,919	10,523,011	6,555,095
Removed, wine gal.	10,168,118	7,319,214	10,277,452	7,202,642	10,665,877	6,554,118
Stocks end of mo., wine gal.	1,128,342	799,478	1,083,197	767,079	1,090,504	600,593
Ammonia sulfate prod., tons *a*	59,745	44,985	59,256	42,045	52,834	36,403
Benzol prod., gal. *b*	11,230,000	7,619,000	10,891,000	7,100,000	9,435,000	6,056,000
Byproduct coke, prod., tons *a*	4,566,573	3,277,523	4,526,602	3,092,806	3,904,321	2,675,089
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	982,732	773,450	967,740	767,599	861,073	691,688
Sheets, ship., lbs.	861,442	675,716	884,318	804,556	840,886	722,699
Rods, prod., lbs.	286,736	174,270	262,792	252,909	219,012	209,256
Rods, ship., lbs.	295,438	266,944	262,835	66,470	239,439	233,921
Tubes, prod., lbs.	91,391	70,001	84,155	79,496	84,253	74,937
Tubes, ship., lbs.	86,820	65,573	84,827	66,470	76,123	75,702
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	725,119	1,331,717	713,241	944,557	705,640	592,079
Shipments, lbs.	793,028	1,250,528	683,637	1,048,487	676,669	615,549
Molding comp., ship.; lbs.	1,119,050	955,591	1,332,699	989,219	1,152,791	759,027
Methanol (Bureau of the Census)						
Production, crude, gals.	479,622	344,328	463,420	335,380	404,876	303,225
Production, synthetic, gals.	4,611,707	2,617,979	4,158,161	2,294,552	2,639,934	1,929,655
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	3,351,950	2,524,908	3,722,046	2,540,373	3,291,353	2,427,796
Heavy goods, ship., linear yds.	2,204,021	1,643,259	2,760,091	1,975,738	2,515,824	1,961,017
Pyroxylin spreads, lbs. *c*	5,413,300	4,288,697	6,371,331	4,921,674	6,243,461	4,998,483
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	$19,321	$12,613	$19,774	$13,254	$20,000	$14,300
Crude sulfur *d*	$777	$600	$1,547	$1,326	$874	$1,321
Coal-tar chemicals *d*	$1,813	$817	$1,798	$890	$1,114	$1,021
Industrial chemicals *d*	$4,464	$2,093	$5,160	$2,511	$4,152	$1,940
Imports						
Chemicals and related prod. *d*	$14,000	$13,716	$13,445	$8,048	$11,338	$13,000
Coal-tar chemicals *d*	$1,567	$1,917	$1,604	$1,393	$1,494	$1,623
Industrial chemicals *d*	$1,465	$1,295	$1,421	$1,750	$1,254	$1,732
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	122.2	114.6	122.0	114.9	117.7	114.6
Other than petroleum	121.8	113.2	121.8	113.5	116.4	112.7
Chemicals	137.6	119.3	133.6	116.8	123.6	114.5
Explosives	106.6	86.4	104.2	87.8	99.9	88.6
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	133.0	118.3	133.1	119.3	124.6	118.1
Other than petroleum	131.5	113.5	131.0	115.1	121.4	112.9
Chemicals	161.5	130.4	157.9	130.4	139.7	123.6
Explosives	128.9	96.1	125.2	101.1	114.4	97.6
Price index chemicals	......	......	82.1	80.5	81.2	81.0
Chem. and drugs	......	......	78.1	77.1	77.3	77.3
Fert. mat.	......	......	70.6	67.5	69.2	67.2
Paint and paint mat.	......	......	85.7	81.1	84.7	80.4
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	......	......	112,699	134,929	123,792	116,828
Ammonium sulfate	......	......	8,809	5,613	6,973	4,573
Total phosphate rock	......	......	58,402	67,078	58,113	78,233
Total potash fertilizers	......	......	7,648	18,061	17,214	4,189
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials	......	......	112,411	156,034	87,434	128,389
Ammonium sulfate	......	......	13,422	5,005	19,223	21,440
Sodium nitrate	......	......	42,204	32,971	10,445	20,829
Total potash fertilizer	......	......	14,571	64,124	15,877	42,407

INDUSTRIAL TRENDS



Business: Federal Index of Industrial Activity for November was estimated at 125.0, fully 5 points greater than for October and 6 above the 1929 average (119). However, the rate of increase, as shown on the N. Y. *Times* Index above, was perceptibly less during the last few weeks of '39.

Steel: November's steel output—5,462,616 tons—was the greatest in that industry's history. Its operating rate during that month was 93.26% of capacity, as compared with 61.81% for the like '38 month.

Automotive: Retail car and truck sales in December were running at the second highest December rate on record. 302,906 units were sold in November and last month's total is expected to be at least 10% better.

Retail Trade: Holiday volume for mail order and chain outlets has been estimated at about 10% better than in the same '38 season. Department store sales in the larger trading areas were, on the whole, not much greater in volume than for the previous Christmas.

Wholesale Trade: Buyers, in general, are confining their purchases to cover only 2 or 3 months' requirements. Less prospect of wide advances over the next few months, and more stable price structures have contributed to the cautious note now evident in most wholesale trading.

Commodity Prices: In mid-December, the Dow-Jones futures index closed at 62.70 (Dec. 15), highest since

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the previous peak on Sept. 10, '37, 63.10. In the last 4 months, the general level has remained about the same. The Dept. of Labor's wholesale commodity price index remains at 80, about 20% below the 1926 average.

Textile: The rayon industry operated at capacity during November, yarn shipments totaling 32,900,000 lbs. Producers' stocks were at an extremely low level on Oct. 31—9,400,000 lbs.—about enough for a week's supply. Hosiery deliveries in the 10 months of '39 set a new record of 114,031,453 dozen pairs. Wool consumption (apparel class) for 1939 will be close to the 1935 peak of 659 million lbs.

Leather: Shoe production for 1939 is likely to establish an all-time high, surpassing the 415,227,000 pairs of '36. An early estimate gives 419,500,000 pairs as the probable output for the 12 months of last year.

Paper and Pulp: November paper output (78,886 tons) resulted from the mills' running at an average of over 97% of capacity during that month. This was the highest rate of operations in the 5 years that production data have been compiled by the American Paper and Pulp Association.

Construction: Engineering contracts for November amounted to $302,215,000. Total engineering volume for the 11 months of '39 ($2,812,529,000) was greater than for the whole of '38, and 12.3% ahead of the like 11-month period of '38.

Electric Output: Energy produced during November totaled 10,048,697 kwh., averaging 12.3% greater than in the like '38 month.

Carloadings: Through the week ended Dec. 16, loadings for 1939 totaled 32,897,672 cars—some 11% or more greater than for the like period of '38.

Outlook: The general opinion holds that capital-goods industries such as steel, rails, etc., will experience some easing of production schedules during the next 3 months—but, no slump of appreciable extent is foreseen for these months. Steel operations will probably diminish to about 75 or 80 per cent. of capacity, and may be considered indicative of the degree of business decline that can be expected for the near future. The effect of European wars, insofar as purchases here are concerned, has still to materialize to the extent at first expected.

MONTHLY STATISTICS (cont'd)

FERTILIZER: (Cont'd)	Nov. 1939	Nov. 1938	Oct. 1939	Oct. 1938	Sept. 1939	Sept. 1938
Superphosphate e (Nat. Fert. Association)						
Production, bulk	359,292	287,123	350,396	259,305	257,987	229,961
Shipments, total	166,230	133,803	287,103	213,161	351,057	334,084
Northern area	91,219	66,239	160,357	122,569	281,374	261,181
Southern area	75,011	67,564	126,746	90,592	69,683	72,903
Stocks, end of month, total	1,508,231	1,595,469	1,266,029	1,388,395	1,151,976	1,295,213
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	110,205	146,872	210,116	131,199	215,877	226,692
Total, 12 southern	108,139	146,145	190,065	121,480	148,250	140,057
Total, 5 midwest	2,066	727	20,050	9,719	67,267	86,635
Fertilizer employment *i*	91.2	88.0	98.5	89.2	98.4	92.1
Fertilizer payrolls *i*	76.0	65.4	79.8	70.4	86.3	77.7
Value imports, fert. and mat. *d*	$2,159	$2,805	$2,536	$3,994	$1,983	$3,427
GENERAL:						
Acceptances outst'd'g *f*	$222	$273	$221	$269	$215	$261
Coal prod., anthracite, tons	3,946,000	3,803,000	4,557,000	3,518,678	4,776,000	3,388,000
Coal prod., bituminous, tons	42,835,000	35,925,000	41,574,000	34,900,000	37,695,000	32,286,000
Com. paper outst'd'g *f*	$214	$206	$205	$213	$209	$212
Failures, Dun & Bradstreet	886	984	916	997	758	866
Factory payrolls *i*	101.8	84.4	101.3	84.2	93.6	81.6
Factory employment *i*	103.8	93.3	103.3	92.4	100.0	92.0
Merchandise imports *d*	235,402,000	176,187,000	$215,281	$178,024	$181,461	$167,592
Merchandise exports *d*	292,734,000	252,381,000	$332,079	$277,668	$288,573	$246,361
GENERAL MANUFACTURING:						
Automotive production	351,782	372,413	313,377	209,512	188,751	83,534
Boot and shoe prod., pairs	31,872,015	30,053,832	37,072,568	35,012,310	36,378,651	38,280,231
Bldg. contracts, Dodge *j*	$299,847	$301,679	$261,796	$357,698	$323,227	$300,900
Newsprint prod., U. S. tons	78,886	75,855	78,591	72,827	77,309	68,315
Newsprint prod., Canada, tons.	288,726	245,226	280,985	254,872	253,230	231,940
Glass Containers, gross‡	4,300	3,709	4,891	3,866	4,250	365.3
Plate glass prod., sq. ft.	15,812,000	12,883,448	18,368,917	12,868,717	13,662,855	8,873,344
Window glass prod., boxes	1,142,570	882,595	1,121,288	641,394	913,980	882,595
Steel ingot prod., tons	5,462,616	3,558,363	5,393,821	3,105,000	4,231,000	2,657,748
% steel capacity	93.26	61.81	89.14	52.45	73.0	44.8
Pig iron prod., tons	3,720,436	2,269,983	3,627,590	2,067,000	2,878,556	1,680,435
U.S. cons'pt. crude rub., lg. tons	54,322	49,050	55,764	40,333	50,150	37,823
Tire shipments	......	......	5,188,000	4,126,000	5,565,356	3,887,604
Tire production	......	......	5,431,000	4,183,000	4,984,505	3,915,873
Tire inventories	......	......	8,657,000	8,237,000	8,334,660	8,022,430
Cotton consumpt., bales	718,721	596,416	686,936	543,857	624,902	533,399
Cotton spindles oper.	22,774,170	22,447,106	22,658,994	22,113,952	22,231,976	22,183,972
Silk deliveries, bales	32,241	41,599	41,858	35,631	36,869	38,844
Wool Consumption *s*	39.0	34.1	39.4	28.3	36.2	28.5
Rayon deliv., lbs.	32,900,000	21,700,000	34,100,000	27,000,000	32,800,000	35,800,000
Hosiery (all kinds) *t*	......	......	9,910,650	8,831,360	9,101,774	8,465,143
Rayon employment *i*	314.0	299.9	310.8	301.4	300.2	302.2
Rayon payrolls *i*	310.7	277.1	303.4	277.0	286.4	282.1
Soap employment *i*	87.5	79.2	90.4	83.0	88.5	82.5
Soap payrolls *i*	103.9	91.9	109.0	98.6	107.1	98.4
Paper and pulp employment *i*	115.3	105.9	113.6	104.8	108.8	104.0
Paper and pulp payrolls *i*	124.7	103.0	125.6	106.6	113.4	101.6
Leather employment	87.9	85.3	88.4	82.5	86.5	79.8
Leather payrolls *i*	87.2	82.3	88.2	79.4	84.2	76.7
Glass employment *i*	110.2	98.0	106.2	93.1	100.9	87.4
Glass payrolls *i*	120.6	103.5	121.2	97.5	105.0	86.7
Rubber prod. employment *i*	94.0	82.3	92.4	77.6	86.0	75.8
Rubber prod. payrolls *i*	100.0	83.0	101.9	77.7	91.2	74.8
Dyeing and fin. employment *i*	134.3	120.0	132.9	116.1	124.9	114.3
Dyeing and fin. payrolls *i*	115.0	101.6	115.5	100.8	107.6	98.1
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)	58.4	57.8	62.5	58.6	67.0	59.5
Gasoline prod., *p*	60,656	48,201	54,974	48,294	51,890	48,300
Cottonseed oil consumpt., bbls.	......	......	483,261	281,028	444,743	261,879
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments	$30,472,039	$26,253,314	$35,827,911	$30,007,078	$38,379,427	$31,046,584
Trade sales (580 establishments)	$14,980,510	$13,183,545	$18,466,640	$16,128,067	$21,413,297	$17,431,211
Industrial sales, total	$12,482,932	$10,638,281	$14,007,459	$10,985,822	$13,381,467	$10,492,087
Paint & Varnish, employ. *i*	125.4	117.1	125.1	117.6	122,1	117.2
Paint & Varnish, payrolls *i*	132.0	116.0	134.7	118.6	127.5	116.7

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 384 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted.

Chemical Finances

December, 1939—p. 49

4th Quarter Earnings Greatest of Year

Allied Chemical & Dye declared a special year-end dividend of $3 on common stock, payable Dec. 28 to stock of record on Dec. 21. Payments for the year are thus brought to $9, as compared with $6 in '38. Allied's total payments for '39 are said to be the largest cash distribution in its history.

Hercules Powder may bring profits for the year to about $3.90 a share, benefitting from heavy demand for cellulose products from the rayon and lacquer trades.

Monsanto, it is believed, will be able to pay $1.10 or more in the December quarter, bringing the year's net to about $3.65 a share. Monsanto's expansion of its plastics production facilities was responsible for the relatively poor income in the first half of '39.

Union Carbide may show $4 a share for the full year; the 9-month earnings were $2.20, of which 92c was contributed in the September quarter alone. Fourth-quarter income should be substantially augmented by anti-freeze sales and by increased volume of business from ferro-alloys and oxygen.

Commercial Solvents Nets 60c per Share in '39

Commercial Solvents is expected to recover in the neighborhood of 25c a share for each of its 2,636,878 shares of capital stock for the quarter ended Dec. 31, which would bring total net for '39 to about 60c a share. This compares with a net loss of $294,358 in '38 and $1,586,917 in '37.

As a result of the development of more diversified sources of income, combined with an expected firmer price structure for solvents during 1940, the company will probably be able to operate at a better rate of profit than last year.

Heyden Chemical Pays 39th Annual Bonus

Heyden Chemical Corp., N. Y. City, distributed to its employees last month a Christmas bonus equivalent to about 10 days' pay for each. This custom has been carried out by Heyden since 1900. In addition to the bonus, employees receive 2-week vacations every year, when they have been in the corporation's employ for 10 years' those with shorter terms of service receive one week's vacation annually.

Price Trend of Representative Chemical Company Stocks

	Nov. 25	Dec. 2	Dec. 9	Dec. 16	Dec. 23	Net gain or loss last mo.	Price on Dec. 24 1938	1939 High	1939 Low
Air Reduction	56	55⅞	56½	55	54⅜	—1⅝	65	68	45¼
Allied Chem.	173	172¾	169½	179	176	+3	185	200½	151½
Amer. Cyan. "B"	31⅜	31¾	31⅝	33¼	33¼	+1⅞	27¼	35¾	18⅛
Amer. Agric. Chem.	20	20¼	21¼	20½	21	+1	22¼	24½	16
Columbian Carbon	91½	91½	92	92	92	+ ½	90	96	73
Comm'l Solv.	13	12⅝	13¼	13½	13¼	+ ¼	9⅜	16	8⅝
Dow Chemical	135	135	135	137	138	+3	133¾	143½	101½
Du Pont	177	177¾	180	179⅛	179	+2	150½	188⅛	126¼
Hercules Powder	87½	86⅛	86½	90	89	+1½	83	101½	63
Mathieson Alkali	29	29⅛	29	29½	30⅞	+1⅞	35⅞	37⅜	20¾
Monsanto Chemical	105½	104⅛	104½	106¾	107	+1½	105¾	114¾	85¾
Std. of N. J.	45¾	44⅝	44⅜	43⅛	44⅜	—1⅜	52	53½	38
Texas Gulf	34½	33⅛	33½	32⅜	32½	—2	31	38½	26
Union Carbide	86½	87½	86¾	87	87½	+1	89	94¼	65½
U. S. I.	21¼	21½	22¼	21½	24⅛	+2⅞	23	29⅜	13½

Earnings Statements Summarized

Company:	Annual dividends	Net income 1939	Net income 1938	Common share earnings 1939	Common share earnings 1938	Surplus after dividends 1939	Surplus after dividends 1938
Canadian Industrial Alcohol:							
Year, August 31	y $.15	$212,348	......	$.19	...	......	......
Diamond Match Co.:							
‡Sept. 30 quarter	y 1.50	537,998	$638,743	.45	$.59	......	......
Nine months, Sept. 30	y 1.50	1,586,245	1,540.269	1.30	1.23	......	......
General Aniline & Film Corp.:							
Nine months, Sept. 30	ak3.50 bk .35	2,936,004	......	a3.66 b .36	...	......	......
Glidden Co.:							
Six months, Oct. 31	y .50	1,487,402	193,026	1.53	p.96	......	......
Year, Oct. 31	y .50	1,853,549	205,597	1.70	p1.03	1,403,663	d644,187
Liquid Carbonic Corp.:							
Year, Sept. 30	k 1.00	1,137,326	1,265,976	1.62	1.80	$437,326	$390,976
Rayonier, Inc.:							
October 31 quarter	f	652,636	64,894	.35	p.10	......	......
Six months, Oct. 31	f	870,152	†118,370	.25	...	......	......
Southern Phosphate Corp.:							
Ten months, Oct. 31	.60	81,384	......	.37	...	......	......
West Virginia Pulp & Paper Co.:							
Year, October 31	y .20	1,095,389	260,353	.18	p1.67	d20,077	d945,358

a On first preferred stock; *b* On second preferred stock; *d* Deficit; *f* No common dividend; *k* For the year 1939; *p* On preferred stock; *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods.

Dividends and Dates

Name	Div.	Stock Record	Payable
Air Reduction, q.	25c	Dec. 30	Jan. 15
Allied Chem. & Dye, q.	$1.50	Dec. 9	Dec. 20
Allied Chem. & Dye, e.	$3.00	Dec. 21	Dec. 28
Amer. Agric. Chem.	30c	Dec. 16	Dec. 27
Amer. Cyanamid, Cl, A & B, q.	15c	Dec. 15	Jan. 2
Amer. Cyanamid, pf., q.	12½c	Dec. 15	Jan. 2
Canadian Ind., Cl. A & B, Yr.-End	$2.75	Dec. 20	Dec. 26
Canadian Ind., pf., q.	$1.75	Dec. 30	Jan. 15
Colgate-Palmolive-Peet, pf., q.	$1.50	Dec. 5	Jan. 1
Consol. Chem. Ind., pt., pf., A, Ac.	75c	Dec. 18	Dec. 28
Crown-Zellerbach, i	25c	Dec. 13	Jan. 2
Devoe & Raynolds, Cl, A & B, Sp'l	25c	Dec. 22	Jan. 2
Devoe & Raynolds, pf., q.	$1.75	Dec. 22	Jan. 2
Diamond Match, pt. pf., s.	75c	Feb. 10	Mar. 1
DuPont, $4.50 pf., q.	$1.12½	Jan. 10	Jan. 25
DuPont, deb., q.	$1.50	Jan. 10	Jan. 25
Eastman Kodak, q.	$1.50	Dec. 5	Jan. 2
Eastman Kodak, pf., q.	$1.50	Dec. 5	Jan. 2
Gen'l. Aniline & Film, Cl. A	$1.50	Dec. 15	Dec. 18
Gen'l. Aniline & Film, Cl. B	15c	Dec. 15	Dec. 18
Gen'l. Pr. Ink	50c	Dec. 19	Dec. 27
Gen'l. Pr. Ink, pf., q.	$1.50	Dec. 19	Jan. 2
Glidden Co.	50c	Dec. 11	Dec. 23
Glidden Co., pf., q.	56¼c	Dec. 20	Jan. 2
Hercules Powder, Yr.-End	$1.65	Dec. 11	Dec. 22
Ind. Rayon, Yr.-End	50c	Dec. 8	Dec. 26
Int'l Silver, pf.	$7.00	Dec. 13	Dec. 26
Int'l. Vitamin	7½c	Dec. 19	Dec. 29
Johns-Manville	$2.00	Dec. 8	Dec. 22
Johns-Manville, pf., q.	$1.75	Dec. 15	Jan. 1
Koppers, 6% pf., Ac.	$3.75	Dec. 9	Dec. 18
Koppers, 6% pf., q.	$1.50	Dec. 9	Jan. 2
Mathieson Alkali Wks., q.	37½c	Dec. 5	Dec. 23
Mathieson Alkali Wks., pf., q.	$1.75	Dec. 5	Dec. 23
Merck & Co., e.	75c	Dec. 12	Dec. 22
Merck & Co.	25c	Dec. 12	Dec. 22
Merck & Co., pf., q.	$1.50	Dec. 20	Jan. 1
Monroe Chem Co., pf., q.	87½c	Dec. 15	Jan. 1
No. Amer. Rayon, Cl. A & B	$2.00	Dec. 14	Dec. 20
No. Amer. Rayon, pr. pf., q.	75c	Dec. 20	Jan. 1
Paraffine Cos.	75c	Dec. 6	Dec. 23
Paraffine Cos., pf., q.	$1.00	Jan. 2	Jan. 15
Parker Rust-Proof	$1.00	Dec. 22	Dec. 27
Quaker-Oats, q.	$1.25	Dec. 1	Dec. 23
Quaker Oats, q.	$1.50	Feb. 1	Feb. 29
Ruberoid Co.	80c	Dec. 5	Dec. 20
Staley (A.E.) Mfg.	40c	Dec. 10	Dec. 20
Staley (A.E.) Mfg., $5 pf., q.	$1.25	Dec. 10	Dec. 20
Staley (A.E.) Mfg., 7% pf., s.	$3.50	Dec. 20	Jan. 1
Union Carbide	50c	Dec. 8	Jan. 1
United Carbon	75c	Dec. 2	Dec. 18
United Dyewood, pf., q.	$1.75	Dec. 8	Jan. 2
Victor Chem. Wks.	65c	Dec. 16	Dec. 27
W. Va. Pulp & Paper	5c	Dec. 15	Jan. 2

Ac, Accumulations; e, extra; i, interim; s, semi-annual; sp'l, special.

Du Pont To Pay Nearly $8 on Common Stock

Du Pont is expected to show at least $7.80 for the year on its common stock, the estimate including both chemical and G. M. earnings. Company's chemical profits formed the greater part of its earnings during the year just ended.

Chemical Finances December, 1939—p. 49

Chemical Finances
December, 1939—p. 50

Chemical Stocks and Bonds

Price Range December 1939 Last	Dec. 1939 High	Dec. 1939 Low	1938 High	1938 Low	1937 High	1937 Low	Sales (Number of shares) December 1939	Sales 1939	Stocks	Par $	Shares Listed	Dividends*	Earnings** $-per-share-$ 1938	1937	1936
NEW YORK STOCK EXCHANGE															
68¼	71½	53	61	46¼	55	46	6,400	55,900	Abbott Labs.	No	640,000	$1.70	2.43	2.51	2.21
56¾	68	45¼	67⅞	40	80¼	44½	25,600	281,000	Air Reduction	No	2,563,992	1.50	1.47	2.86	2.79
176½	200½	151½	197	124	258½	145	18,600	158,000	Allied Chem & Dye	No	2,214,099	6.00	5.92	11.19	11.44
20¼	24½	16	28½	22	33¾	17⅞	9,000	87,000	Amer. Agric. Chem	No	627,987	1.43	2.23	2.95	1.57
6¾	11⅞	5½	15	9	30¾	8¼	6,900	91,500	Amer. Com. Alcohol	No	260,930	....	—2.05	3.23	4.55
32¼	37	21	31½	20	46	22	2,700	30,000	Archer-Dan.-Midland	No	545,416	1.25	.43	5.03	3.05
63	71	50	68	36	94	38	2,400	19,700	Atlas Powder Co.	No	249,163	2.25	2.69	4.40	4.21
123¼	127	116	126¼	105	133	101	790	4,610	5% conv. cum. pfd.	100	68,597	5.00	14.77	20.90	20.85
29⅛	30¼	13⅝	26⅜	9	41¼	13	69,100	936,900	Celanese Corp. Amer.	No	1,000,000	....	.26	2.04	2.33
108½	109⅞	84	96	82	115	90	3,250	25,820	prior pfd.	100	164,818	7.00	15.05	27.07	27.25
18	18	11½	17	7⅛	25¾	8½	57,400	604,900	Colgate-Palm.-Peet	No	1,962,087	.25	1.77	—.35	1.40
105⅛	107	101⅞	104¼	78	104½	95	1,300	14,800	6% pfd.	100	233,098	6.00	21.12	3.21	17.13
92½	96	73	98½	53¾	125¾	65	3,300	38,600	Columbian Carbon	No	537,406	4.00	5.13	8.31	7.48
14	16	8⅝	12¼	5⅞	21¼	5	69,700	1,303,700	Commercial Solvents	No	2,636,878	....	—.11	.60	.85
64¾	67½	54⅞	70¾	53	71¼	50½	17,900	214,100	Corn Products	25	2,530,000	3.00	3.18	2.52	3.86
172¾	177	150	177	162	171½	153	800	9,900	7% cum. pfd.	100	245,738	7.00	39.69	32.96	46.76
21	32⅜	18	40⅞	25	76⅛	29½	4,050	33,170	Devoe & Rayn. A.	No	95,000	2.00	—1.72	4.05	4.49
143½	144⅝	101½	141	87⅞	159¼	79½	3,800	69,700	Dow Chemical	No	945,000	3.00	3.91	4.15	4.48
182	188½	126¼	154¾	90½	180⅛	98	47,200	571,700	DuPont de Nemours	20	11,065,762	3.25	3.74	7.37	7.54
122	124⅛	112	120½	109½	112	107½	10,500	55,600	4½% pfd.	No	500,000	4.50	87.27	165.48	......
126 7/32	142	126 1/16	138½	130¾	135½	130	900	56,400	6% cum. deb.	100	1,092,948	6.00	45.92	81.70	84.21
166⅞	186⅛	138⅛	187	121½	198	144	9,300	253,500	Eastman Kodak	No	2,250,921	6.50	7.54	9.76	8.23
175	183½	155½	173	157	164	150	420	4,350	6% cum.	100	61,657	6.00	281.22	362.45	306,64
33⅛	36	18¼	32	19⅞	32¼	18	14,500	255,800	Freeport Texas	10	796,380	2.00	1.87	3.30	2.43
9⅞	10⅞	7	12⅛	6¾	19	8½	10,500	69,300	Gen. Printing Ink	1	735,960	.50	.62	1.32	1.32
17	24½	14	28½	13	51½	19⅛	11,400	175,500	Glidden Co.	No	829,989	.50	—.29	2.62	3.29
37	47	34	51½	37	58⅛	43	1,200	8,700	4½% cum. pfd.	50	199,940	2.25	1.03	12.72	15.43
112¼	112¼	93	111	76¾	117½	80⅛	1,700	22,000	Hazel Atlas	25	434,409	5.00	4.97	6.67	6.55
89	101½	63	87	42¾	92½	50	9,800	140,300	Hercules Powder	No	1,316,710	1.50	1.95	2.97	3.24
131¾	135½	128½	135¼	126¾	135½	125	830	6,730	6% cum. pfd.	100	96,194	6.00	35.31	50.75	48.97
28¼	29½	16¾	30⅜	14⅜	47½	15	17,500	212,100	Industrial Rayon	No	759,325	.25	.24	.34	2.24
44	46¼	17½	34½	15	64¼	20	7,000	112,100	Interchem.	No	289,618	....	.32	1.44	3.02
108½	109½	90	98	80	111½	92	650	8,730	6% pfd.	100	65,661	6.00	7.39	12.26	18.97
1⅞	3⅝	1½	3⅞	2	9⅛	2	15,100	116,800	Intern. Agricul.	No	436,048	....	....	.16	—1.55
36	41	16	29	15	63½	18¾	1,900	33,700	7% cum. pfd.	100	100,000	2.00	7.01	7.70	.23
36⅝	55¾	35	57⅜	36⅞	73⅜	37	150,900	1,794,200	Intern. Nickel	No	14,584,025	2.00	2.09	3.31	2.40
36	38	29	30¼	19½	28¾	19½	1,200	19,600	Intern. Salt	No	240,000	2.00	2.29	2.11	1.70
21	22½	14½	24	19⅛	36	19¼	1,700	14,600	Kellogg (Spencer)	No	509,213	1.40	.71	2.81	2.62
52	56¾	36½	58⅜	23¼	79	33⅝	27,500	303,100	Libbey Owens Ford	No	2,509,750	1.25	1.57	4.19	4.14
15⅛	19	13½	21½	12⅛	26⅞	14	8,600	107,000	Liquid Carbonic	No	700,000	1.25	1.81	2.37	1.58
30⅛	37⅜	20¾	36⅞	19¾	41¾	22	15,000	179,400	Mathieson Alkali	No	828,171	1.50	1.01	1.81	1.76
109¼	114¾	85¾	110	67	107½	71	11,600	141,600	Monsanto Chem.	No	1,241,816	2.00	2.35	4.40	4.01
118	121	110	117½	111	109	105	500	5,010	4½% pfd. A	No	50,000	4.50	31.51	49.99	......
120	122½	112	...	...	...	...	350	5,370	4½% pfd. B	No	50,000	4.50	31.51	49.99	......
19⅞	27½	17⅞	31	17⅛	44	18	32,500	431,800	National Lead	10	3,095,100	.50	.75	.95	1.71
170	173⅛	152	178½	154	171	153	900	7,300	7% cum. "A" pfd.	100	213,793	7.00	26.03	22.86	33.83
143½	145	132	145½	127	150	127	410	6,710	6% cum. "B" pfd.	100	103,277	6.00	35.97	43.77	74.50
12½	17¾	8½	19½	9⅞	41¾	10⅛	18,500	458,700	Newport Industries	1	621,359	....	—.08	2.22	.99
61	70	50	76¼	40	103¾	51¼	21,500	229,800	Owens-Illinois Glass	12.50	2,661,204	1.50	2.02	3.51	3.80
66	66	50⅝	59	39½	65½	43¼	22,000	251,400	Procter & Gamble	No	6,325,087	2.00	2.59	4.08	2.39
118½	119¾	112	122¼	114	118½	114½	690	15,200	5% pfd.	100	169,517	5.00	101.81	157.05	94.14
12⅜	17¼	9⅞	18⅜	10	34¾	14⅞	14,000	246,200	Shell Union Oil	No	13,070,625	.70	.70	1.44	1.35
105¾	107⅞	98½	106½	93	105⅜	91	2,200	25,600	5½% cum. pfd.	100	341,000	5.50	33.18	60.59	57.20
19½	29½	15½	34¾	18½	60⅝	26½	8,700	123,500	Skelly Oil	No	995,349	1.00	2.27	6.07	4.42
98¼	98¼	92	98	84	102⅛	88	600	7,200	6% cum. pfd.	100	64,500	6.00	41.09	97.86	73.16
26⅜	30	22¾	35½	24¾	50	26½	72,000	666,700	S. O. Indiana	25	15,272,020	1.00	1.82	3.16	3.09
43⅞	53½	38	58⅜	39¾	76	42	116,500	1,273,500	S. O. New Jersey	25	26,618,065	1.50	2.86	5.64	3.73
6⅝	9⅛	4	8	3⅞	15⅜	5¼	9,300	176,200	Tenn. Corp.	5	853,696	....	.46	1.09	.41
44½	50¾	32½	49⅝	37⅝	65⅜	34¾	84,400	1,045,800	Texas Corp.	25	10,876,882	2.00	2.13	5.02	4.10
32¾	38½	26	38	26	44	23¾	25,300	316,400	Texas Gulf Sulphur	No	3,840,000	2.00	1.81	3.02	2.57
86¾	94¼	65½	90⅞	57	111	61¼	42,000	694,900	Union Carbide & Carbon	No	9,073,288	2.40	2.77	4.81	4.09
60¼	69½	52	73½	39	91	36¾	4,700	58,800	United Carbon	No	397,885	3.25	3.78	5.91	5.54
23¾	29⅜	13½	30¼	13½	43⅛	16⅛	7,900	145,500	U. S. Indus. Alcohol	No	391,238	....	—1.08	1.24	—.20
33½	40	16	28⅞	11½	39⅜	9¼	20,900	532,600	Vanadium Corp. Amer.	No	376,637	....	.61	2.22	.40
29¾	29¾	18¼	25¼	13½	...	...	3,900	81,200	Victor Chem.	5	696,000	.90	1.05	1.01	1.16
3¾	5¾	2½	5⅝	2¾	12¾	2⅛	7,600	168,600	Virginia-Caro. Chem.	No	486,122	....	—1.80	—.05	—2.44
29	33¾	17	32½	15¾	74½	18½	6,200	98,200	6% cum. part. pfd.	100	213,052	....	1.90	5.88	.44
36¾	39¼	15¼	20⅜	10	27¼	10¾	9,900	72,600	Westvaco Chlorine	No	339,362	1.00	1.52	1.46	1.17
37⅝	39½	29	31½	20	34⅞	21⅛	5,400	37,100	cum. pfd.	30	192,000	1.50	4.19	4.09	3.26
NEW YORK CURB EXCHANGE															
33⅝	35¾	18⅜	30¼	15½	37	17⅜	45,300	499,800	Amer. Cyanamid "B"	10	2,520,368	.45	.91	2.09	1.77
107½	112¾	76	92	50	124	69	1,800	18,860	Celanese, 7% cum. 1st pfd.	100	148,179	8.53	8.95	22.32	24.47
3⅝	6¾	3	6¾	3	15	3	1,300	11,200	Celluloid Corp.	15	194,952	....	—2.73	—.92	—.80
7¼	7⅜	4½	12	6½	14⅝	10½	1,200	4,900	Courtauld's Ltd.	£1	24,000,000	.29	.26%	8.64%	8.30%
6½	9¼	5	9⅞	6	10⅝	3½	4,100	21,900	Duval Texas Sulphur	No	500,000	....	.71	.43	.61
68	68	30	41¾	27	47½	31	4,400	18,000	Heyden Chem. Corp.	100	149,643	1.50	2.07	3.94	3.56
101	117	90	115½	55	147½	77	6,200	68,300	Pittsburgh Plate Glass	25	2,142,443	1.75	3.00	8.53	7.15
94½	113½	81	117¾	66	154¾	72¼	4,100	58,350	Sherwin Williams	25	638,927	2.50	2.43	8.76	8.04
114	116	106½	114⅜	107	114	106¼	230	3,170	5% cum. pfd.	50	132,189	5.00	8.76	45.50	41.44
PHILADELPHIA STOCK EXCHANGE															
166	179	135	167	121½	179	115	825	5,725	Pennsylvania Salt	50	150,000	4.50	6.90	11.79	8.57

Price Range December 1939 Last	Dec. 1939 High	Dec. 1939 Low	1938 High	1938 Low	1937 High	1937 Low	Sales December 1939	Sales 1939	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE													
102½	103¾	98	105⅜	99⅛	109½	99	383,000	4,655,000	Amer. I. G. Chem. Conv.	1951	3½	J-D	60,000,000
36½	41½	19	38	25⅜	42½	23	170,000	1,261,000	Anglo Chilean Nitrate inc. deb.	1959	3	A-O	40,000,000
106¼	108⅜	101¾	106⅛	102⅜	102⅞	100⅛	6,000	340,000	Dow Chemical	1941	5	A-O	2,800,000
102⅞	103½	99⅞	102¾	100	102	98½	24,000	212,000	Int. Agric. Corp. 1st Coll. tr. stpd. to 1942	1949	5½	M-N	$25,300,000
36	37	21½	35⅛	24¾	35⅛	21¼	332,000	2,018,000	Lautaro Nitrate inc. deb.	1967	4½-5	J	12,067,000
16½	30	16	35⅛	24¾	25½	20½	1,000	15,000	Ruhr Chem.	1951	3	J-D	5,000,000
95¾	95¾	88¾	...	...	...	...	402,000	2,708,000	Shell Union Oil	1942	5	M-N	5,633,000
104½	105¾	98	104⅛	90¼	102¾	94	55,000	925,000	Skelly Oil	1975	4	J-D	30,500,000
104¾	106¼	97⅜	105⅜	100	102	95	207,000	3,846,000	Standard Oil Co. (New Jersey) deb.	1948	6	A-D	1,500,000
105⅛	106½	94¼	103	98	...	...	276,000	4,372,000	Standard Oil Co. (New Jersey) deb.	1954	2½	J-J	85,000,000
106½	108⅝	102	103	95	105	93½	366,000	4,385,000	Texas Corp.	1951	4	J-J	9,000,000
105½	105⅞	95¼	...	...	...	...	505,000	4,831,000	Texas Corp.	1961	3	J-D	85,000,000
105¾	118½	96	101	77	111	81	115,000	1,209,000	Vanadium Corp. conv.	1953	2¾	J-J	50,000,000

* Paid in 1938, including extras but excluding dividends paid in stock. ** For either fiscal or calendar year.

Calendar of Events*

January

Jan. 12, A. C. S., N. Y. Section, Joint Meeting with S. C. I. for Perkin Medal Presentation, Chemists' Club, N. Y. City.
Jan. 12-13, Louisiana Engineering Society, annual meeting, St. Charles Hotel, New Orleans, La.
Jan. 14-18, National Association of Dyers and Cleaners, Annual Convention, Baltimore, Md.
Jan. 15-17, California Pest Control Association, 6th Annual Convention, Hollywood, Calif.
Jan. 15-19, 4th Annual Pest Control Operators' Conference, Purdue Univ., Lafayette, Ind.
Jan. 15-19, S. A. E.; Annual Meeting and Engineering Display; Fuels and Lubricants Meeting, Book-Cadillac Hotel, Detroit, Mich.
Jan. 17, St. Louis P. V. & L. A., St. Louis, Mo.
Jan. 18, New England Paint and Varnish Production Club, Hotel Vendome, Boston, Mass.
Jan. 19, A. A. T. C. C., Philadelphia Section, Penn A. C., Philadelphia, Pa.
Jan. 19, A. I. Ch. E., N. Y. Chapter.
Jan. 22-26, 6th International Heating and Ventilating Exposition, Lakeside Hall, Civic Center, Cleveland, O.
Jan. 22-23, Compressed Gas Manufacturers' Association, Annual Convention, Waldorf-Astoria Hotel, N. Y. City.
Jan. 23, Oil Trades Association of N. Y., Quarterly Meeting, Waldorf-Astoria Hotel, N. Y. City.
Jan. 23-25, American Wood Preservers' Association, St. Louis, Mo.
Jan. 24-25, American Management Association (Finance Division), N. Y. City.
Jan. 24-25, Liquefied Petroleum Gas Association, Eastern Section, N. Y. City.
Jan. 24, Symposium Meeting, Chemists' Club, N. Y.
Jan. 25, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.
Jan. 26, A. A. T. C. C., N. Y. Section, Swiss Chalet, Rochelle Park, N. J.
Jan. 29-31, Southern Pest Control Operators' Conference, Louisiana State Univ., Baton Rouge, La.

February

Feb. 1, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
Feb. 1-2, Southern Safety Conference, Jackson, Miss.
Feb. 2, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Feb. 5, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
Feb. 9, A. C. S., N. Y. Section, N. Y. City.
Feb 12-14, American Gas Association, Southwestern Regional Sales Conference, Hot Springs, Ark.
Feb. 12-15, American Institute of Min. and Met. Engineers, N. Y. City.
Feb. 14-15, 16th Annual Eastern Safety Conference, Newark, N. J.
Feb. 15, New England Paint and Varnish Production Club, Hotel Vendome, Boston, Mass.
Feb. 16, Society of Chemical Industry, American Section, N. Y. City.
Feb. 19-22, American Paper and Pulp Association, Annual Meeting, Waldorf-Astoria Hotel, N. Y. City.
Feb. 19-22, Technical Association of the Pulp and Paper Industry, Annual Meeting, Roosevelt Hotel, N. Y. City.
Feb. 21, Association of Newsprint Manufacturers of the U. S., N. Y. City.
Feb. 21, St. Louis P. V. & L. A., St. Louis, Mo.
Feb. 22-24, Federation of Paint and Varnish Production Clubs, Southern States Associates, mid-winter meeting, Atlanta Biltmore Hotel, Atlanta, Ga.
Feb. 22-24, Pacific Coast Pest Control Operators' Conference, Univ. of California, Berkeley, Calif.
Feb. 26-28, Liquefied Petroleum Gas Association, annual convention, Netherland-Plaza Hotel, Cincinnati, O.
Feb. 29, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.

March

Mar. 1, A. I. Ch. E., N. Y. Chapter.
Mar. 1, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Mar. 4, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
Mar. 4-8, A. S. T. M., Statler Hotel, Detroit, Mich.
Mar. 4-8, A. S. T. M., Committee Week, Detroit, Mich.
Mar. 6, A. S. T. M., Spring Meeting, Detroit, Mich.
Mar. 7, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
Mar. 8, A. C. S., N. Y. Section, Joint Meeting with S. C. I., Nichols Medal Presentation, N. Y. City.
Mar. 11-12, 1940 Massachusetts Safety Conference, Boston, Mass.
Mar. 13, Philadelphia P. V. & L. A., Phila., Pa.
Mar. 13-15, A. S. T. M., Committee D-13 on Textile Materials, Charlotte, N. C.
Mar. 13-16, American Society of Biological Chemists, New Orleans, La.
Mar. 14, 15th Annual Drug, Chemical and Allied Trades Banquet, DCAT Section, N. Y. City Board of Trade, Waldorf-Astoria Hotel, N. Y. City.
Mar. 14-15, New England Gas Association, Hotel Statler, Boston, Mass.
Mar. 18-20, Amer. Water Works Ass'n., Southeastern Section, Thomas Jefferson Hotel, Birmingham, Ala.
Mar. 20, St. Louis P. V. & L. A., St. Louis, Mo.
Mar. 20-22, New Jersey Sewage Works Association, Silver Anniversary Meeting, Stacy Trent Hotel, Trenton, N. J.
Mar. 21, New England Paint and Varnish Production Club, Hotel Vendome, Boston, Mass.
Mar. 21, Oil Trades Association of N. Y., Annual Meeting and Election of Officers, Waldorf-Astoria Hotel, N. Y. City.
Mar. 26-29, American Management Association, 10th annual Packaging Exposition and Conference, Hotel Astor, N. Y. City.
Mar. 28, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.

April

Apr. 1-2, Tanners' Council of America, Official Opening of American Leathers, Waldorf-Astoria Hotel, N. Y. City.
Apr. 4, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
Apr. 4-5, Amer. Water Work Ass'n., Indiana Section, Purdue Univ., Lafayette, Ind.
Apr. 5, A. C. S., N. Y. Section, N. Y. City.
Apr. 5, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Apr. 5-6, Amer. Water Works Ass'n., Montana Section, Helena, Mont.
Apr. 8, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
Apr. 8-10, Amer. Water Works, Ass'n., Kentucky-Tennessee Section, Lexington, Ky.
Apr. 8-12, American Chemical Society, 99th Meeting, Cincinnati, O.
Apr. 8-12, Rubber Division, A. C. S., Spring meeting, jointly with semi-annual convention of the A. C. S., Cincinnati, O.
Apr. 9-11, Western Pennsylvania Safety Engineering Conference, Pittsburgh, Pa.
Apr. 15-17, Mid-West Gas Association, Lincoln, Neb.
Apr. 16-18, 11th Annual Greater N. Y. Safety Conference, N. Y. City.
Apr. 16-18, All-Ohio Safety Conference, Columbus, O.
Apr. 17, National Wholesale Druggists' Association, Board of Control Meeting, Palmer House, Chicago, Ill.
Apr. 17, St. Louis P. V. & L. A., St. Louis, Mo.
Apr. 18, New England Paint and Varnish Production Club, Hotel Vendome, Boston, Mass.
Apr. 19, A. I. Ch. E., N. Y. Chapter.
Apr. 19, Society of Chemical Industry, American Section, N. Y. City.
Apr. 21-25, American Water Works Association, annual convention, Kansas City, Mo.
Apr. 22-25, Society of Motion Picture Engineers, Chalfonte-Haddon Hall, Atlantic City, N. J.
Apr. 24-27, Electrochemical Society, semi-annual meeting, Galen Hall, Wernersville, Pa.
Apr. 25, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.
Apr. 29-30, Liquefied Petroleum Gas Association, Southern Section, Tutweiler Hotel, Birmingham, Ala.
Apr. 29-May 2, Chamber of Commerce of the U. S. A. (annual meeting).
Apr. 30-May 2, 18th Annual Midwest Safety Conference, Chicago, Ill.

May

May 1-3, Amer. Soc. of Mech. Eng., Spring meeting, Worcester, Mass.
May 2, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
May 3, Baltimore Paint & Varnish Production Club, Baltimore, Md.
May 6, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
May 6-8, Amer. Spice Trade Association, Annual Convention, N. Y. City.
May 8, Philadelphia P. V. & L. A., Phila., Pa.
May 8-11, National Fire Protection Association, Atlantic City, N. J.
May 9-10, Amer. Water Works Ass'n., Ohio Section, Akron, O.
May 9-10, Tanners' Council of America, Spring Meeting, The Greenbrier, White Sulphur Springs, W. Va.
May 9-11, Amer. Water Works Ass'n., Pacific Northwest Section, Portland Hotel, Portland, Ore.
May 10, A. C. S., N. Y. Section, Annual Meeting, N. Y. City.
May 13-15, A. I. Ch. E., semi-annual meeting, Statler Hotel, Buffalo, N. Y.
May 16, New England Paint and Varnish Production Club, Hotel Vendome, Boston, Mass.
May 16-18, Amer. Water Works Ass'n., Florida Section, Gainesville, Fla.
May 20-22, Glass Container Association of America, Greenbrier Hotel, White Sulphur Springs, W. Va.
May 21, St. Louis P. V. & L. A., Annual May Party, St. Louis, Mo.
May 22-24, Amer. Water Works Ass'n., Illinois Section, Congress Hotel, Chicago, Ill.
May 22-24, Michigan State-Wide Safety Conference, Lansing, Mich.
May 23, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.
May 27-29, American Leather Chemists' Association, Annual Meeting, The Sagamore, Bolton Landing, Lake George, N. Y.
May 27-31, American Petroleum Institute, 10th Mid-Year Meeting, Blackstone & Texas Hotels, Fort Worth, Tex.

*** Each month, hereafter, we will publish a Calendar of Events covering the 60-day period immediately following. Secretaries of associations, societies and other groups in the chemical and allied fields are urged to cooperate by sending into us complete data. We will be glad, of course, to give by letter or phone any data on dates already set to those interested.**

Calendar of Events, 1940, — p. 2

June

June 3, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
June 3-6, National Association of Purchasing Agents, annual convention, Netherland-Plaza Hotel, Cincinnati, O.
June 6, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
June 6-7, Amer. Water Works Ass'n., N. Y. Section, Ithaca Hotel, Ithaca, N. Y.
June 6-7, Manufacturing Chemists' Association of the U. S., Annual Meeting.
June 7, Baltimore Paint & Varnish Production Club, Baltimore, Md.
June 8, A. C. S., N. Y. Section, Annual Outing.
June 11, First Golf Tournament, Salesmen's Association of the American Chemical Industry; details later.
June 17-19, National Association of Insecticide and Disinfectant Manufacturers, mid-year meeting, Spink-Wawasee Hotel, Lake Wawasee, Ind.
June 17-21, Amer. Soc. of Mech. Eng., semi-annual meeting, Milwaukee, Wisc.
June 27, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.

July

July 9, Second Golf Tournament, Salesmen's Association of the American Chemical Industry; details later.

August

Aug. 13, Third Golf Tournament, Salesmen's Association of the American Chemical Industry; details later.
Aug. 26-27, American Soybean Association, annual meeting, Dearborn Inn., Dearborn, Mich.

September

Sept. 5, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
Sept. 6, Baltimore Paint & Varnish Production Club, 1st Fall Meeting, Baltimore, Md.
Sept. 9, Fourth Golf Tournament, Salesmen's Association of the American Chemical Industry; details later.
Sept. 9, Chicago Paint & Varnish Production Club, Electric Bldg., Civic Opera Bldg., Chicago, Ill.
Sept. 9-12, Illuminating Engineering Society, Essex and Sussex Hotel, Spring Lake, N. J.
Sept. 9-13, American Chemical Society, 100th Meeting, Detroit, Mich.
Sept. 18, St. Louis P. V. & L. A., 1st Fall Meeting, St. Louis, Mo.
Sept. 18-20, National Petroleum Association, Hotel Traymore, Atlantic City, N. J.
Sept. 23-27, National Association of Retail Druggists, Annual Convention and Show, Hotel Pennsylvania, N. Y. City.
Sept. 26, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.
Sept. 30-Oct. 3, National Wholesale Druggists' Association, Annual Convention, The Greenbrier, White Sulphur Springs, W. Va.

October

Oct. 3, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
Oct. 4, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Oct. 7, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
Oct. 7-11, National Safety Congress, Stevens Hotel, Chicago.
Oct. 9, Philadelphia P. V. & L. A., Phila., Pa.
Oct. 18-19, American Association of Textile Chemists and Colorists, Annual Meeting, Hotel Commodore, N. Y. City.
Oct. 21-25, Amer. Institute of Min. and Met. Engineers, annual meeting, Cleveland, O.
Oct. 21-25, American Society for Metals, annual meeting, Cleveland, O.
Oct. 27-Nov. 1, National Electrical Manufacturers' Association, Annual Meeting, Waldorf-Astoria Hotel, N. Y. City.
Oct. 28-30, 8th Annual Convention, National Pest Control Association, Hotel Claypool, Indianapolis, Ind.
Oct. 31, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.

November

Nov. 1, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Nov. 4, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
Nov. 7, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
Nov. 11-15, American Petroleum Institute, 21st Annual Meeting, Stevens Hotel, Chicago, Ill.
Nov. 12, Oil Trades Association of N. Y., Annual Banquet, Waldorf-Astoria Hotel, N. Y. City.
Nov. 20, St. Louis P. V. & L. A., St. Louis, Mo.
Nov. 21, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.

December

Dec. 2, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Bldg., Chicago, Ill.
Dec. 5, Indianapolis P. V. & L. A., Columbia Club, Indianapolis, Ind.
Dec. 6, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Dec. 17, St. Louis P. V. & L. A., Christmas Party, St. Louis, Mo.
Dec. 19, Chicago Drug and Chemical Association, Morrison Hotel, Chicago, Ill.

Naval Stores
Apr. 1, '39-Sept. 30, '39

It should be borne in mind that gum naval stores production is seasonal. Normally, approximately 72% of the total annual gum crop is produced during the April-September season. Wood naval stores, on the other hand, are produced on the year-'round basis, and governed largely upon the probable consumer demand. It is therefore probable that the wood naval stores production figures for the April-September season represent only about 50% of this class for the season.

As in previous reports of the Bureau of Agricultural Chemistry and Engineering, carryover (stocks) of turpentine and rosin is separated into gum and wood products. Stocks of wood rosin do not include so-called "B wood rosin." Pending the selection of a proper term, the acids recovered from the acidulated soap curds obtained in the production of sulfate pulp continue to be referred to as "liquid resin." The data on production, consumption and stocks are expressed in commercial units: turpentine, bbls. of 50 gauge gals.; rosin, bbls. of 500 lbs. gross. Carryover data do not include turpentine or rosin producible from crude gum or crude steam-distilled, or destructively-distilled wood turpentine on hand.

New Loans for Gum Naval Stores Trade

A gum naval stores loan program for 1940, to be operated through the American Turpentine Farmers' Association Cooperative of Valdosta, Ga., with money furnished by Commodity Credit Corp., was announced late last month. Loans will be made on eligible gum naval stores stored by approved warehousemen at interior points: Helena and Valdosta, Ga.; Estill, S. C.; and Wiggins, Miss., and at Jacksonville and Pensacola, Fla.; Mobile, Ala., and Savannah and Brunswick, Ga.

GUM TURPENTINE PRODUCTION

Percentage by States

	1939-40 6 mos.	1938-39 6 mos.	1938-39 12 mos.
North Carolina	[1]	[1]	[1]
South Carolina	2.43	2.79	2.69
Georgia	59.26	58.37	57.24
Florida	26.40	25.26	27.86
Alabama	8.28	9.92	8.38
Mississippi	2.72	2.94	3.11
Louisiana	0.91	0.72	0.72
Texas	[2]	[2]	[2]
Total	100.00	100.00	100.00

(1) Combined with South Carolina.
(2) Combined with Louisiana.

Details of Production

(By naval stores seasons beginning April 1 and ending the following March 31)

	TURPENTINE (Bbls.—50 gals.)			ROSIN (Bbls.—500 lbs. gross)		
	1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mch. 12 mos.	1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mch. 12 mos.
Gum[1]	270,167	386,018	534,291	900,442	1,242,901	1,792.951
Reclaimed (Gum)	0	0	0	17,331	21,142	39,979
Steam Dist. Wood	66,234	57,045	129,091	420,031	364,592	762,913
Sulfate Wood	15,300	17,823	40,467[2]	10,379	6,572	16,548
Dest. Dist. Wood	3,001	2,484	5,369	0	0	
Total	354,702	463,370	709,218	1,348,183	1,635,207	2,612,391

GUM TURPENTINE AND ROSIN PRODUCTION BY STATES

States						
South Carolina	6,548	10,781	14,387	22,263	34,943	50,156
Georgia	160,073	225,329	305,791	535,000	717,299	1,016.643
Florida	71,328	97,496	148,870	236,357	319,520	504,691
Alabama	22,404	38,283	44,730	73,914	123,290	149,649
Mississippi	7,358	11,352	16,652	24,751	38,786	58,639
Louisiana	2,456	2,777	3,861	8,157	9,063	13,173
Total	270,167	386,018	534,291	900,442	1,242,901	1,792,951

(1) Gum naval stores production includes barrels of turpentine and barrels of rosin estimated for those from whom reports were not received. These estimates, based on information from factors and others, are included to permit a better comparison with previous years; (2) Several producers reported that all or part of their crude sulfate turpentine had been used for fuel.

Details of Carryover (Stocks) March 31

	TURPENTINE (Bbls.—50 gals.)				ROSIN (Bbls.—500 lbs. gross)			
	1939 Sept. 30		1938 Sept. 30	1939 Mar. 31	1939 Sept. 30		1938 Sept. 30	1939 Mar. 31
	Gum	Wood	Gum and Wood	Gum and Wood	Gum	Wood	Gum and Wood	Gum and Wood
Gum stills[1]	13,723	......	16,470	16,858	81,917	......	162,276	137,597
So. Conc. points:								
Savannah[2]	26,243	......	52,488	37,639	263,489	......	257,406	281,882
Jacksonville[2]	49,500	......	46,328	44,454	330,603	......	222,469	261,099
Pensacola[2]	19,902	......	32,009	27,533	66,738	......	62,337	65,107
Other So. Ports	45,141	......	74,804	63,114	264,158	......	217,586	242,716
Interior yards	75,590	......	51,101	49,270	390,090	......	158,251	201,685
Total	216,376	......	256,730	222,010	1,315,078	......	918,049	1,052,489
Wood plants:								
Steam dist.[3]	......	6,419	13,027	13,026	......	60,505	136,575	152,042
Sulfate	......	3,692	7,418	6,238	......	4,471	3.307	5,201
Destructive dist.	......	622	1,234	652	......	......	......	......
Total	......	10,733	21,679	19,916	......	64,976	139.882	157,243
Distributing points:								
Eastern	6,591	3,179	10,522	10,410	3,785	3,380	7,586	9,450
Central	16,309	4,920	26,816	21,991	5,657	2,329	9,985	8,696
Western	2,109	1,425	6,989	6,130	499	391	1,241	1,031
Total[4]	25,009	9,524	44,327	38,531	9,941	6,100	18,812	19,177
Industrial plants[5]	12,752	5,152	15,775	17,008	199,157	50,997	342,511	255,464

Summary of Carryover (Stocks)

Gum stills	13,723	......	16,470	16,858	81,917	......	162,276	137,597
Conc. points	216,376	......	256,730	222,010	1,315,078	......	918,049	1,052,489
Wood plants	......	10,733	21,679	19,916	......	64,976	139,882	157,243
Dist. points	25,009	9,524	44,327	38,531	9,941	6,100	18,812	19,177
Industrial plants	12,752	5,152	15,775	17,008	199,157	50,997	342,511	255,464
Total in U. S.	267,860	25,409	354,981	314,323	1,606,093	122,073	1,581,530	1,621,970
At and afloat to London[6]	not-available		31,300	25,050				
Total, U. S. and London			386,281	339,373				

(1) Compiled from reports by producers and factors; (2) Official Board of Trade and Chamber of Commerce reports; (3) Does not include by-products from making pale grades from FF wood rosin; (4) Compiled from reports of individual distributors; (5) Compiled from reports of individual consumers.

Naval Stores, 1938-39 Season Apr. 1, '39-Sept. 30, '39—p. 5

Naval Stores, 1938-39

Season—Apr. 1, '39-Sept. 30, '39—p. 6

Under the 1939 program, loans were made on 120,000 bbls. of turpentine and on 613,000 bbls. or drums of rosin. Liquidation of these 1939 stocks commenced on Jan. 1 of this year. Under the 1938 program, 185,000 bbls. of turpentine and 937,000 bbls. or drums of rosin were involved. Stocks of '38 origin still held by the corporation on Dec. 18 amounted to 2,332 bbls. of turpentine and 565,000 bbls. or drums of rosin.

For comparable figures, see Statistical and Technical Data Section, p. 697, Dec. 1938 (Naval Stores Season Apr. 1, 1938-Sept. 30, 1938); also, Statistical and Technical Data Section, p. 119, January 1938 (Naval Stores Season Apr. 1, 1937-Sept. 30, 1937).

Summary of Supply, Distribution and Carryover of Turpentine and Rosin

(By naval stores seasons beginning April 1 and ending the following March 31)

	TURPENTINE (Bbls.—50 gals.)			ROSIN (Bbls.—500 lbs. gross)		
	1939-40 Apr.-Sept. 6 mos	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mch. 12 mos.	1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mch. 12 mos.
SUPPLY AND DISTRIBUTION						
Carryover, April 1	314,323	218,774	218,774	1,621,970	999,347	999,347
Production	354,702	463,370	709,218	1,348,183	1,635,207	2,612,391
Imports	11,664	7,677	16,571	2,175	261	340
Available supply	680,689	689,821	944,563	2,972,328	2,634,815	3,612,078
Less carryover, Sept. 30	293,269	354,981	314,323	1,728,166	1,581,530	1,621,970
Apparent total consumption	387,420	334,840	630,240	1,244,162	1,053,285	1,990,108
Less exports	131,125	110,123	210,226	467,754	439,783	821,381
Apparent U. S. consumption	256,295	224,717	420,014	776,408	613,502	1,168,727
PRODUCTION AND IMPORTS						
Gum	270,167	386,018	534,291	917,773[1]	1,264,043[1]	1,832,930[1]
Wood	84,535	77,352	174,927	430,410	371,164	779,461
Imports	11,664	7,677	16,571	2,175	261	340
Total	366,366	471,047	725,789	1,350,358	1,635,468	2,612,731
CARRYOVER (STOCKS)						
Carryover, April 1	314,323	218,774	218,774	1,621,970	999,347	999,347
Carryover, September 30	293,269	354,981	314,323	1,728,166	1,581,530	1,621,970[2]

(1) Includes reclaimed rosin; (2) Carryover for March 31.

EXPORTS OF TURPENTINE; SEASON 1939-40, 6 MOS. APR.-SEPT.

(Bbls.—50 gals.)

Destination	Gum Turpentine 1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mar. 12 mos.	Wood Turpentine 1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mar. 12 mos.	Total Exports of Turpentine 1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mar. 12 mos.
United Kingdom	58,927	51,569	92,284	9,694	6,097	12,558	68,621	57,666	104,842
Germany and N. Europe	19,128	16,675	33,990	2,982	5,834	8,244	22,110	22,509	42,234
Italy and S. Europe	2,009	284	1,136	2,035	476	2,757	4,044	760	3,893
Argentine	1,888	1,272	2,785	284	271	375	2,172	1,543	3,160
Brazil	1,170	981	1,903	430	262	643	1,600	1,243	2,546
Other South America	2,467	1,825	3,433	390	325	728	2,857	2,150	4,161
Japan	27	207	328	0	212	395	27	419	723
Australia and New Zealand	6,242	4,803	12,043	2,306	2,069	3,988	8,548	6,872	16,031
Netherlands East Indies	55	13	19	3	....	9	58	13	28
Canada	13,621	11,636	21,343	2,390	1,525	2,880	16,011	13,161	24,223
All other Exports	3,332	2,506	5,645	1,745	1,281	2,740	5,077	3,787	8,385
Totals	108,866	91,771	174,909	22,259	18,352	35,317	131,125	110,123	210,226

EXPORTS OF GUM AND WOOD ROSIN; SEASON 1939-40, 6 MOS. APR.-SEPT.

(Bbls.—599 lbs. net)

Destination	GUM ROSIN 1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mar. 12 mos.	WOOD ROSIN 1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mar. 12 mos.	TOTAL ROSIN EXPORTS 1939-40 Apr.-Sept. 6 mos.	1938-39 Apr.-Sept. 6 mos.	1938-39 Apr.-Mar. 12 mos.
United Kingdom	75,077	69,615	125,844	39,837	44,269	81,876	114,914	113,884	207,720
Germany and N. Europe	86,487	47,594	109,695	53,714	40,786	83,971	140,201	88,380	193,666
Italy and S. Europe	1,703	17,707	29,287	1,226	5,441	10,983	2,929	23,148	40,270
Argentine	15,748	15,353	25,515	8,499	8,929	16,285	24,247	24,282	41,800
Brazil	9,477	15,810	23,069	28,781	23,570	36,577	38,258	39,380	59,646
Other South America	12,540	12,132	18,924	9,620	7,181	13,761	22,160	19,313	32,685
Japan	19,221	25,082	51,027	5,285	3,187	7,597	24,506	28,269	58,624
Australia and New Zealand	11,403	8,262	16,995	3,211	4,720	8,819	14,614	12,982	25,814
Netherlands East Indies	9,893	15,118	25,355	8,451	9,521	16,783	18,344	24,639	42,138
Canada	19,549	19,416	36,127	8,200	7,128	12,381	27,749	26,544	48,508
All other Exports	28,512	18,348	37,368	11,320	20,614	33,142	39,832	38,962	70,510
Totals	289,610	264,437	499,206	178,144	175,346	322,175	467,754	439,783	821,381

U. S. Chemical Patents
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A Complete Check-List of Products, Chemicals, Process Industries

Agricultural Chemicals

Fire-blight-preventing germicide, for pear trees and allied plants, being a solution of a metal derivative of a tannin. No. 2,178,270. Ned McLaughlin Sleeper, Upper Lake, Calif., one-third to Alfred Leroy Barber, one-sixth to Rex Lake, and one-sixth to William Thomas Gordon, Lake County, Calif.

Parasiticide, comprising a reaction product of acetonyl acetone with ammonium thiocyanate. No. 2,181,217. William P. ter Horst, Packanack Lake, N. J., to United States Rubber Co., New York City.

Non-blooming solution of a chlorinated phenol, containing a rosin ester, used to impregnate lumber and other cellulosic material from bacterial attack. No. 2,182,080. Ira Hatfield, Webster Groves, Mo., to Monsanto Chemical Co., St. Louis, Mo.

Calf feeding mineral supplement, comprising 30-50% bone meal, 10-30% calcium carbonate, 10-20% calcium lactate, and 10-20% calcium gluconate. No. 2,182,171. James M. Coyner, Madison, Wis., to Armour & Co., Chicago, Ill.

Production an edible, precooked foodstuff from soya bean flour. No. 2,182,175. Rupert G. Gates, Sharon, Mass., one-half to Charles L. Wickersham, Sharpsburg, Pa.

Cellulose

Production of cellulose ethers from cellulosic materials containing or yielding free hydroxy groups, comprising reacting such a material with an etherifying agent in the presence of dimethylamino-cyclohexane. No. 2,181,264. Henry Dreyfus, London, England.

Method and apparatus for recovering chemicals from waste cellulose liquor, comprising drying out the liquor in a heated, inclined retort. No. 2,181,330. Erkki Johannes Janhunen, Karihaara, Kemi, Finland.

Production of cellulose from bagasse, comprising treating the latter with a cane wax solvent, and then digesting the solvent-treated bagasse with cellulose-liberating chemicals. No. 2,181,785. John P. Foster, Paia, Hawaii, and Herman L. Joachim, San Francisco, Calif. to Maui Agricultural Co. Ltd., Paia, Hawaii.

Method preparing cellulose esters, comprising reacting anhydrous alkali metal cellulosates with an organic acid halide or anhydride. No. 2,181,906. Clemmy O. Miller and Arthur E. Siehrs, Chicago, Ill., to North American Rayon Corp., New York City.

Manufacture alkali metal cellulosates, comprising treating cellulosic material with a liquid ammonia solution of alkali metal, said treatment being conducted at about the boiling-point of liquid ammonia at normal pressure. No. 2,181,919. Philip C. Scherer, Blacksburg, Va., to North American Rayon Corp., New York City.

Production a rigid, flame-proof, and sound absorbent plastic composition from bagasse, containing a mixture of oxide and chloride of the same metal, glue, and water; about 50% of the composition comprises voids of occluded air spaces. No. 2,182,535. John Guy Britton, Lansdowne, Pa.

Method moistureproofing sheets of regenerated cellulose. No. 2,182,765. Charles Forbes Silsby, White Plains, N. Y., to The Solvay Process Co., Syracuse, N. Y.

Composition comprising essentially a cellulose ester of an organic acid and an acetal, resulting from the condensation of an aldehyde with a monobasic alcohol. No. 2,183,317. Harold Allden Auden, Banstead, Hanns Peter Staudinger, Sutton, and Henry Malcolm Hutchinson, Banstead, Eng., to The Distillers Co. Ltd., Edinburgh, Scotland.

Chemical Specialty

Metal container having its interior coated with a thin layer of shellac, and a relatively thicker continuous layer of wax thereupon. No. 2,175,972. William Charles Rainer, to Crown Cork & Seal Co., Inc., both of Baltimore, Md.

Stable composition of nicotine and copper hydroxide, combined with a protein of the group: casein and albumen, and with formaldehyde; stability of the whole is determined by its formaldehyde content. No. 2,175,980. Grover D. Turnbow, Oakland, Calif.

Emulsifiable oil, comprising a mineral spray oil containing a relatively small quantity of undecylenic acid, sufficient to import good emulsifying and spreading qualities. No. 2,175,988. Marcellus T. Flaxman, Wilmington, Calif., to Union Oil Co. of California, Los Angeles, Calif.

Sulfurized cutting oil, comprising a light lubricating oil containing a quantity of a reaction product of a dihydronaphthalene polymer with elemental sulfur. No. 2,178,325. William Hoffman Kobbe, to The Texas Company, both of New York City.

Diesel fuel, containing a small amount of dipropionyl peroxide as an accelerating agent. No. 2,178,327. Ernest Frank Pevere, Beacon, and Wilfred N. Meyer, Newburgh, N. Y., to The Texas Company, New York City.

Lubricating composition, comprising as the principal lubricating ingredient the combination of a halogenated organic ring compound and sulfur, in solution in active form. No. 2,178,513. Carl F. Prutton, East Cleveland, and Albert K. Smith, Shaker Heights, Ohio, to The Lubri-Zol Development Corp., Cleveland, Ohio.

Extreme pressure lubricating composition, comprising a major amount of lubricating oil containing a small quantity of addition agent capable of reacting with the metal surface being lubricated, and an organic phosphate having a vapor pressure less than atmospheric at 140° C. No. 2,178,514. Carl F. Prutton, East Cleveland, Ohio, to The Lubri-Zol Corp., Cleveland, Ohio.

Lubricating oil composition, containing a small amount of a chlorinated aliphatic compound and a small amount of an organic sulfur derivative, said addition compounds being oil-soluble, and of boiling-point above 140° C. No. 2,178,534. Bert H. Lincoln and Waldo L. Steiner, Ponca City, Okla., to The Lubri-Zol Development Corp., Cleveland, Ohio.

Material for marking laundry, comprising luminescent pigment suspended in a clear lacquer vehicle, said pigment being visible under ultraviolet light. No. 2,180,508. John L. De Fraine, Brooklyn, and James Y. Smith, Mastic Park, Long Island; said Smith to said De Fraine.

Wood veneer casein glue, comprising an admixture of aqueous alkaline medium, isolated milk casein and sodium formaldehyde bisulfite, the amount of water being at least 4 times that of casein and that of bisulfite compound 2¾-3% of the casein. No. 2,180,543. George H. Osgood, Tacoma, Wash.

Glue composition for application by mechanical rolls, being a combination of artificial resin condensation product and cellulosic flour in combination with sodium or potassium nitrate. No. 2,180,547. Russell G. Peterson, to George H. Osgood, both of Tacoma, Wash.

Liquid lubricating oil composition, comprising a petroleum oil and a metallic phenyl stearate of the class consisting of phenyl stearates of aluminum, barium, cadmium, chromium, magnesium, and nickel. No 2,180,697. Arnold C. Vobach, Whiting, Ind., to Sinclair Refining Co., New York City.

Volatilizing liquid fumigant for treating fruit, effective in the range 50-70° F., comprising essentially about 1 part by volume of ethylene oxide and 3 parts ethylene dichloride. No. 2,180,744. John D. Maxcy, Albany, Calif., to Carbide & Carbon Chemicals Corp., a corp. of New York.

Ethyl glycerine, as a solvent for an aromatic flavoring compound. No. 2,180,932. Fritz E. Stockelbach, Verona, N. J.

Froth flotation assistant for concentrating minerals, being a substituted biguanide of the type: $(R)R_1=N-C(=NH)-NH-C(=NH)-NH_2$. No. 2,180,926. David Walker Jayne, Jr., Old Greenwich, and Arvid Emil Anderson, New Canaan, Conn., to American Cyanamid Co., New York City.

Adhesive composition, comprising glue as the major non-volatile ingredient, a plasticizer, water-soluble blending solvent less volatile than water, and 5-20% of a phosphatide based on the weight of glue. No. 2,181,129. Albert J. Heberer, Maywood, Ill., to The Glidden Company, Cleveland, Ohio.

Sheet of glassine paper coated with a transparent, moistureproof film comprising chlorinated rubber and a wax. No. 2,181,160. Fred K. Shankweiler, Newport, Del., to Hercules Powder Co., Wilmington, Del.

Leather and textile processing agent, comprising the sulfuric acid derivative of a higher aliphatic hydroxy-ether ketone. No. 2,181,476. Albert Frank Bowles, Jersey City, and Saul Kaplan, Teaneck, N. J., to The Richards Chemical Works, Inc., Jersey City, N. J.

Composition for liners, being a flexible, non-tacky, vinyl resin comprising: polymerized vinyl ester resin (14-17, tricresyl phosphate (4-6), and petrolatum jelly (0.35-0.6). (Parts by Weight). No. 2,181,481. Daniel M. Gray, Wheeling, W. Va., to Hazel-Atlas Glass Co., Wheeling, W. Va.

Wetting agent, comprising a higher fatty acid salt of an aminohydroxy compound of the aliphatic series. No. 2,181,534. Jerome Martin, to Commerical Solvents Corp., both of Terre Haute, Ind.

Liquid composition for coating the thread surfaces of metal screw-threaded fastening elements, comprising a water dispersion of wetted graphite in latex, in the proportion of 10% or less of latex dry solids to graphite, by weight. No. 2,181,835. Charles E. S. Place, to Clare L. Brackett, both of Detroit, Mich.

Improved mineral hydrocarbon lubricant containing a minor proportion of sulfopolymers derived by reacting sulfur with unsaturated derivatives from cracked mineral oil. No. 2,181,964. Martin B. Chittick, to The Pure Oil Co., both of Chicago, Ill.

Luminescent material, comprising manganese activated beryllium germanate of the first subgroup of the fourth group of the periodic system. No. 2,182,087. Humboldt W. Leverenz, Collingswood, N. J., to Radio Corp. of America, a corp. of Delaware.

A light-colored glue, containing 1-2% potassium nitrate and about 0.6% hydrogen peroxide. No. 2,182,186. Walter M. Urbain and Lloyd B. Jensen, to Industrial Patents Corp., all of Chicago, Ill.

Egg product, comprising dried egg material and a glyceryl ester of a higher fatty acid having a free glyceryl alcohol group. No. 2,182,209. Roy C. Newton and Leon D. Mink, to Industrial Patents Corp., all of Chicago, Ill.

Refractory cement composition, comprising a magnesia cement containing a thorium compound. No. 2,182,291. Andre Michel Fleuret, Paris, France, to Etablissements Rouzaud & Fils, Paris, France.

Casein adhesive plastic composition, comprising casein and an alkali metal tripolyphosphate. No. 2,182,357. Charles Schwartz, to Hall Laboratories, Inc., both of Pittsburgh, Pa.

Transparent rubbery sheeting, comprising polyvinyl acetal resin and a mixture of alkyl carbamate and dibutyl phthalate. No. 2,182,359. Henry B. Smith and Donald R. Swan, to Eastman Kodak Co., all of Rochester, N. Y.

Transparent, rubbery sheeting, comprising polyvinyl acetal resin (largely of the butyraldehyde acetal type) and an elasticizing amount of ortho-cresyl toluene sulfonate. No. 2,182,360. Henry B. Smith to Eastman Kodak Co., both of Rochester, N. Y.

Transparent rubber-like sheeting, comprising polyvinyl acetal resin (largely of the formaldehyde acetal type) and an elasticizing amount of benzyl acid succinate. No. 2,182,361. Henry B. Smith to Eastman Kodak Co., both of Rochester, N. Y.

Transparent, rubbery sheeting, comprising polyvinyl acetal resin (largely acetaldehyde acetal resin) and an elasticizing amount of di-(2-beta-ethoxy-ethoxyethyl)- formal. No. 2,182,362. Henry B. Smith to Eastman Kodak Co., both of Rochester, N. Y.

Transparent, rubbery sheeting, comprising polyvinyl acetal resin (largely of the acetaldehyde and butyraldehyde acetal type) and an elasticizing amount of di-(2-beta-butoxy-ethoxyethyl)- formal. No. 2,182,363. Henry B. Smith and Donald R. Swan to Eastman Kodak Co., all of Rochester, N. Y.

Transparent, rubbery sheeting, comprising polyvinyl acetal and an elasticizing amount of tripropionin. No. 2,182,371. Emmett K. Carver and Bruce E. Gramkee, to Eastman Kodak Co., all of Rochester, N. Y.

Acetic acid adhesive, comprising 32% white flake glue, 5% Venice turpentine and 5% glycerine. No. 2,182,399. Walter P. Hilbourn, Lansing, Michigan.

Water-resistant glue for wood, comprising animal glue, water, and sodium silicate. No. 2,182,425. Charles N. Cone, Portland, Oregon, to M and M Wood Working Co., Portland, Oregon.

Method extinguishing ignited light metals, comprising spraying with a dilute aqueous silicate solution containing dispersed particles of a saponifiable oil. No. 2,182,440. Fritz Kotz, Magdeburg, and Armin Bergmann, Dessau, Germany, to Junkers Flugzeug-und Motorenwerke Aktiengesellschaft, Dessau, Germany.

Adhesive composition containing unhydrolyzed starch and a salt of a deacetylated chitin. No. 2,182,524. Robert W. Maxwell, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Noncorrosive antifreeze, comprising a denatured alcohol (100 cc.), light hydrocarbon mineral oil (10-4.2 cc.), sulfonated castor oil (0.03-0.3 cc.),

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and 0.1-0.4 gms. of sodium salicylate. No 2,182,612. Cyrus D. Eaton, Lansdowne, Pa., to The American Distilling Co., Inc., Philadelphia, Pa.

A monocalcium phosphate having a relatively high percentage of granular, non-friable product. No. 2,182,613. Augustus H. Fiske, Warren, R. I., to Rumford Chemical Works, Rumford, R. I.

Method for restoring inked documents to a legible state, comprising treating iron-containing characters with an acid solution of potassium ferrocyanide, washing the paper, and then treating with a solution of a reagent precipitating the potassium ferrocyanide remaining on the paper to an insoluble state having a contrasting color to the revived characters. No. 2,182,672. Alexander Lowy and Clyde H. Campbell, Pittsburgh, Pa.

Pipe lining cement derived from blast furnace slag and cement clinker, the latter having a high calcium oxide content (about 61%) and also containing ferric oxide, silica, alumina, and magnesia. No. 2,182,714. Joshua Chitwood Witt, Chicago, Ill.

Ship bottom paint, being an anti-corrosive non-fouling composition comprising 36% coal tar, 28% sulfur, 14% resin, 3% Paris Green and 19% benzol. No. 2,182,840. Giuseppe Capurro, Union City, N. J.

As a froth flotation separating agent for potassium and sodium chlorides admixed in an ore, octyl sulfate or its soluble salts. No. 2,182,845. Benjamin R. Harris, Chicago, Ill.

Cathode ray-fluorescent screen, comprising a mixture of cadmium tungstate and magnesium silicate. No. 2,182,860. Nicolaas Willem Hendrik Addink and Jan Hendrik de Boer, Eindhoven, Netherlands, to Radio Corp. of America, New York City.

Corrosion-preventive composition, comprising degras and an alkali-metal salt of oil-soluble petroleum sulfonates. No. 2,182,992. Robert B. Lebo, Elizabeth, N. J., to Stanco, Incorporated.

Pour depressor, comprising a chlorinated paraffin wax with stearic acid, having been reacted together in the presence of anhydrous aluminum chloride. No. 2,183,009. Joseph Cole, Whiting, Ind., to Sinclair Refining Co., N. Y. City.

Anti-freeze composition, containing a very slightly acid solution of calcium chloride in water, also containing small amounts of glycerine and potassium iodide. No. 2,183,178. Ollie M. Williams and James W. Baker, Vandalia, and Benjamin F. Butler, Auxvasse, Mo.

Water-in-oil paint emulsion, being a homogeneous, stabilized mixture of drying oil, pigment, a water-insoluble zinc compound and a minor amount of water. No. 2,183,227. Herman A. Scholz, Oak Park, Ill., to United States Gypsum Co., Chicago, Ill.

Foundry mold material, comprising a porous mica powder held together with a binder. No. 2,183,424. George C. Clark, Beverly Hills, Calif.

Germicidal composition, comprising a phenyl-mercuric salt stabilized with a tribasic organic acid. No. 2,183,493. Mahlon J. Rentschler, Willoughby, and Donald B. Bradner, Hamilton, Ohio, to The Hamilton Labs. Inc., Hamilton, Ohio.

Coal Tar Chemicals

Preparation a 4-alkyl dibromophenol, said alkyl radical having at least 5 carbon atoms. No. 2,176,010. Lindley E. Mills, to The Dow Chemical Co., both of Midland, Mich.

Production of perylene compounds, by reacting a benzanthrone acid halide compound with an organic compound having at least 6 carbon atoms, in the presence of an acid condensing agent. No. 2,178,521. Heinrich Neresheimer and Anton Vilsmeier, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Works, Inc., New York City.

Method reclaiming sulfonate sludge from still residues resulting from the treatment and distillation of light oil derived from the byproduct coking of coal. No. 2,180,728. Frank W. Corkery, Crafton, Pa., to Pennsylvania Industrial Chemical Corp., a corp. of Pennsylvania.

Method and apparatus separating fluid-tar and sludge from hot, newly-made water-gas. No. 2,180,848. Charles H. Printz, to The Gas Machinery Co., both of Cleveland, Ohio.

Production alkylated phenols, comprising heating a mixture of olefin and a mono-hydroxy-phenolic compound, in the presence of a sulfuric acid solution of an alkali sulfate. No. 2,181,823. Donald R. Stevens, Swissvale, and Joseph E. Nickels, Pittsburgh, Pa., to Gulf Research & Development Co., Pittsburgh, Pa.

Production hydroxy-alkyl ethers of benzophenone. No. 2,182,786. Gerald H. Coleman and Clarence L. Moyle, to The Dow Chemical Co., all of Midland, Mich.

Production cyclohexyl-chloro-diphenyl ethers. No. 2,182,827. Frank B. Smith, to The Dow Chemical Co., both of Midland, Mich.

Process hydrogenating mono-nitro-phenols in the liquid phase, in the presence of nickel catalyst, to form a mono-amino-phenol. No. 2,183,019. Clyde O. Henke, Wilmington, Del., William A. Douglass, Penns Grove, and Roland G. Benner, Carneys Points, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Method decolorizing an alkylated aromatic compound, comprising mixing therewith a monobasic alcohol and a hydrogen-displacing metal, and subjecting the mixture to mild hydrogenation, and then separating the product. No. 2,183,405. John F. Olin, Grosse Ile, Mich., to The Sharples Solvents Corp., a corp. of Del.

Coatings

Manufacture a paint composition, comprising mixing a color pigment finely divided in an aqueous emulsion of a synthetic resin which contains the radicals of a polyhydric alcohol, polybasic acid, and an unsaturated fatty acid of the drying type, an emulsifier. No. 2,178,474. Friedrich Frick Uerdingen, Germany, to I. G. Farbenindustrie, Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Coating composition, comprising a filler bound with an aqueous emulsion of a condensation product from a polyhydric alcohol, phthalic acid, and an unsaturated fatty acid. No. 2,178,475. Friederich Frick, Uerdingen, Germany, to I. G. Farbenindustrie A. G., Frankfort-on-the-Main, Germany.

Manufacture a varnish containing a paraffin hydrocarbon-insoluble resin derived from pine wood, having tolerance for a paraffin hydrocarbon, and liquid at ordinary temperatures. No. 2,180,535. Evart E. Mayfield, Elsmere, Del., to Hercules Powder Co., Wilmington, Del.

Method coating underground metal pipe, consisting of coating the pipe with Portland cement incorporated in boiled linseed oil with a water-insoluble metallic soap of an organic acid, letting this coat set, and then applying an overlay of pitch containing a minor proportion of fibrous binding. No. 2,181,361. Albert C. Bean, Kansas City, Mo., and Joseph B. Ray, Fort Worth, Texas.

Manufacture a clear, rapid and hard drying resin, comprising heating glycerol, phthalic anhydride, linseed oil acids and tung oil, the last constituting 10-60% of the total oil acids present. No. 2,181,893. Horace H. Hopkins, Ridley Park, Pa., and Frank A. McDermott, Claymont, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Process for lining metal pipe or conduit with bituminous coatings. No. 2,182,227. Oscar G. Goldman, San Francisco, Calif.

Method coating an article with a resin composition. No. 2,182,304. Clifford Jay Rolle, Yonkers, N. Y., to Interchemical Corp., New York City.

Nitrocellulose composition for brush-coating brush pulleys, comprising nitrocellulose in a volatile solvent also containing iron filings, the last forming a roughened surface of increased tractive power on the pulley belt. No. 2,182,774. Joseph Birnbaum, Vienna, Austria, to Manhattan Lubricants Co., Inc., Brooklyn, N. Y.

Process for precipitating copper in finely-divided form upon a surface, comprising reducing a copper solution in the cold with formaldehyde; said solution containing cuprotartrate, gum arabic, caustic soda, and a catalytic amount of silver compound. No. 2,183,202. Paolo Misciattelli, Rome, Italy.

Preparation an oil- and grease-resistant coating composition, comprising a resin-oil preparation softening at 175-200° F. or above to a suitable working material. No. 2,183,234. William H. Butler, Palisades Park, N. J., to Bakelite Corporation, New York City.

Dyes, Stains, etc.

Method treating vat dyestuffs, wherein the dye is dissolved in conc. sulfuric acid and the solution so formed is contacted with water to precipitate the dyestuff in finely-divided form, the sulfuric acid solution being sprayed, and the resulting atomized solution is then contacted with water. No. 2,176,011. Wilfred M. Murch and Le Roy G. Kline, to The Dow Chemical Co., all of Midland, Mich.

Manufacture dyestuff materials of the cyanoanthraquinone series having in the 1-position an amino radical of the group: amine, alkylamino, and acidylamino, in the 2-position one of the group: H, Br, and SO_3H, a bromine atom in the 4-position, there being present one cyano-group in the 5- or 8-positions. No. 2,180,336. Edwin C. Buxbaum, Silverside Hts., Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture an alpha-cyanoanthraquinone dyestuff having in the 1-position an amino radical of the group: amino, alkylamino, and acidylamino, in the 2-position one of the group: hydrogen, bromine, and sulfonic acid, and in the 4-position an arylamino radical of the benzene series. No. 2,180,337. Edwin C. Buxbaum, Silverside Hts., Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture vat dyestuffs of the anthraquinone-acridone series. No. 2,180,419. Erwin Kramer, Cologne-Deutz, Germany, to General Aniline Works, Inc., New York City.

Manufacture soluble salts of the indole sulfonic acid series. No. 2,180,801. Kurt Engel, St. Louis, Ht. Rhin, France, to J. R. Geigy S. A., Basel, Switzerland.

Manufacture of derivatives of alpha-amino-anthraquinones, being dyestuffs yielding on the fiber violet to blue to green-blue tints. No. 2,180,805. Friederich Felix, Basel, Paul Grossmann, Binningen, and Max Bommer, Riehen, to Society of Chemical Industry in Basle, Basel, all of Switzerland.

Method deodorizing methyl violet, comprising extracting an aqueous solution of its salt with a solvent liquid incapable of dissolving all of the salt, whereby the solvent layer takes up the odoriferous material, which layer is then separated. No. 2,181,369. Orville S. Frank, Chicago, Ill., to The Sherwin-Williams Co., Cleveland, Ohio.

Preparation of a series of azo dyestuff heavy metal complexes, being either water-soluble dyes or insoluble colors. No. 2,182,055. Hugo Schweitzer, Leverkusen-Wiesdorf, Germany, to General Aniline Works, Inc., New York City.

Process for producing reserves under dyeings of ester salts of leuco vat dyestuffs. No. 2,182,140. Ernst Tschan, Basel, Switzerland, to Durand & Huguenin A. G., Basel, Switzerland.

Preparation a polyazo-aryl dyestuff. No. 2,182,347. Arthur R. Murphy, deceased, late of Penns Grove, N. J., by Margaret R. Murphy, administratrix, Penns Grove, N. J., and Henry Jordan, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation a polyazo-aryl dyestuff. No. 2,182,348. Arthur R. Murphy, deceased, late of Penns Grove, N. J., by Margaret R. Murphy, administratrix, Penns Grove, N. J., and Henry Jordan, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production sulfur dyestuffs yielding brown shades on unmordanted shades, being the reaction product of a peri-naphtholamine disulfonate, an aldehyde, and an alkali metal polysulfide. No. 2,182,350. Robert L. Perkins, East Aurora, N. Y., to National Aniline & Chemical Co., New York City.

Production sulfur dyestuffs yielding brown shades on unmordanted cotton, being reaction products of a disulfonated 1,8-aminonaphthol, a fural, and an alkali metal polysulfide. No. 2,182,351. Ellis L. Punnett, Buffalo, N. Y., to National Aniline & Chemical Co., New York City.

Method treating casein fibre with dilute aqueous monosodium phosphate, as a pretreatment for adding chrome dyestuffs to the fibre. No. 2,182,553. Marino Fortunato, Milan, Italy, to "Montecatini" Societa Generale per l'Industria Mineraria e Chimica, Milan, Italy.

Preparation complex azo dyestuffs of superior characteristics of fastness and color tone. No. 2,182,721. Achille Conzetti, Basel, Switzerland, to J. R. Geigy A. G., Basel, Switzerland.

Production phthalocyanine dyestuffs, comprising admixing phthalodinitrile and sodamide dimethylaniline, and adding to the heated mixture and alkanol. No. 2,182,763. Fritz Muehlbauer, Ludwigshafen-on-the-Rhine, Germany, to General Aniline Works, Inc., New York City.

Production black trisazo dyestuffs for leather, especially for application by acid brushing to calf velour. No. 2,183,087. Emil Senn, Riehen, near Basel, Switzerland, to J. R. Geigy A. G., Basel, Switzerland.

Manufacture a chromable dyestuff of the triarylmethane series. No. 2,183,237. Wilhelm Eckert and Karl Schilling, Frankfort-on-the-Main-Hochst, Germany, to General Aniline Works, Inc., New York City.

Mordant, comprising a blend of ungelatinized starch and a water-insoluble metallic oxide. No. 2,183,390. Harold E. Bode, Chicago, Ill., to Corn Products Refining Co., New York City.

Manufacture mono-azo dyestuffs yielding on wool and silk clear orange shades of very good light-fastness. No. 2,183,489. Richard Fleischhauer, Frankfort-on-the-Main, Fechenheim, Germany, to General Aniline Works, Inc., New York City.

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Fine Chemicals

Preparation of mono-alkyl and aralkyl cyanoacetic esters, comprising catalytically hydrogenating the corresponding alkylidene and aralkylidene esters. No. 2,176,018. Arthur C. Cope, Bryn Mawr, Pa., Walter H. Hartung, Baltimore, Md., and Frank S. Crossley, Phila., Pa., to Sharp & Dohme, Inc., Phila., Pa. a corp. of Maryland.

Production of alkylolamine esters from alkylolamines. No. 2,178,174. Morris B. Katzman and Albert K. Epstein, to The Emulsol Corp., all of Chicago, Ill.

Process recovering leucine and tyrosine from solutions of acid-hydrolyzed corn gluten. No. 2,178,210. Arthur Maurice Mark, Argo, Ill., to Corn Products Refining Co., New York City.

Preparation of a halide of benzyl octadecyltbetine. No. 2,178,353. James, H. Werntz, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Method removing alkali chlorides from amino acid solutions, comprising passing HCl gas through the solution at 100-120° F. No. 2,178,510. Louis Gerber, Peoria, Ill., to Corn Products Refining Co., New York City.

Preparation of tert.-N,N-dicycloalkyl-alkyl amines. No. 2,180,344. Frederick F. Blicke, Ann Arbor, Mich.

Preparation an alkyl ester of 12-ketostearic acid. No. 2,180,730. Henly L. Cox, South Charleston, W. Va., to Union Carbide & Carbon Co., a corp. of New York.

Manufacture of carbonyl compounds of the cyclopentanopolyhydrophenanthrene series. No. 2,180,762. Karl Miescher, Riehen, and Hans Kaegi and Placidus Plattner, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Production of coerulein derivatives, by treating a pyrogallol coerulein sulfonic acid with an aqueous sulfite solution. No. 2,180,769. Eduard Peyer, Basel, Switzerland, to Durand & Huguenin A. G., Basel, Switzerland.

Preparation of trifluoromethyl benzaldehydes. No. 2,180,772. Otto Scherer, Frankfort-on-the-Main, Ger., to General Aniline Works, Inc., N. Y. City.

Preparation a water-soluble derivative of the methane series, being a N-chlor-pyridyleradical linked through the methane carbon with an alkylated phenol radical of the benzene series, the alkyl group being of 12-14 carbons in weight. No. 2,180,791. Arnold Brunner, Frankfort-on-the-Main, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Manufacture new basic condensation products, comprising halogenating an aliphatic hydroxyalkylpolyamine, and condensing the product with an organic nitrogen base. No. 2,180,809. Valentin Kartaschoff, Basel, Switzerland, to Chemical Works formerly Sandoz, Basel, Switzerland.

Method brominating benzanthrone, comprising running the reaction in an inert solvent containing an amount of sulfuryl chloride equivalent to the quantity of bromine employed. No. 2,180,835. Melvin Alfred Perkins, Wilmington, Del., and Joseph Deinet, Glassboro, N. J., to E. I. du Pont de Nemours & Co., a corp. of Delaware.

Production aromatic esters by reacting a ketene polymer with aromatic hydroxy compounds, in the presence of a catalyst. No. 2,180,953. Anthony H. Gleason, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Delaware.

Extraction from cashew nut shell liquid of a phenol of the anacadic acid type. No. 2,181,119. Solomon Caplan, New York City, to The Harvel Corporation, a corp. of New Jersey.

Method inhibiting oxidation of an organic compound in contact with a copper compound, comprising adding to said substance said organic compound a small amount of a copper deactivator having the formula HO-A-CH N-R-N CH-A-OH, where A is a 5- or 6-membered heterocyclic compound, where the hetero-atom is nitrogen, the OH radical being attached directly to a ring carbon ortho to the -CH N- group, and R is an aliphatic radical having the 2 N atoms attached directly to different carbon atoms of the same open chain of R. No. 2,181,121. Frederick B. Downing, Carney's Point, and Charles J. Pedersen, Penns Grove, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production of amines, comprising catalytic hydrogenation of *e*-caprolactam at 200-400° C. No. 2,181,140. Wilbur A. Lazier and George W. Rigby, Wilmington, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Preparation oxygen-containing saturated aliphatic compounds, comprising reacting a 1,3-dihalo-isobutane with aqueous alkaline agent at a temperature between 75 and 200° C. No. 2,181,297. Edgar C. Britton and Gerald H. Coleman, to The Dow Chemical Co., all of Midland, Mich.

Production a dinitro derivative of a saturated non-benzenoid hydrocarbon, comprising condensing a secondary nitro derivative with a secondary halo-nitro derivative having halogen and nitro group both on the same carbon atom. No. 2,181,531. Henry B. Hass and Leon W. Seigle, La Fayette, Ind., to Purdue Research Foundation, La Fayette, Ind.

Preparation trifluoromethyl derivatives of benzene acid fluoride. No. 2,181,554. Herbert Kracker, Otto Scherer, Fritz Muller, and Willy Schumacher, Frankfort-on-the-Main, Germany, to General Aniline Works, Inc., New York City.

Hydroquinone photographic developer, containing sodium sulfite, potassium bromide, sodium hydroxide, potash alum, and sodium carbonate. No. 2,181,861. James R. Alburger, Merion, Pa., to Radio Corporation of America, a corp. of Delaware.

Preparation a cold-water-soluble salt, being an interface modifying agent having both lipophile and hydrophile groups in the molecule. No. 2,181,890. Benjamin R. Harris, Chicago, Ill.

Preparation a maltosamine of the general type $C_{11}H_{21}O_{10}C(H)(M)$-$N(R)(R')$, where M is hydrogen or hydroxyl, R hydrogen or alkyl, and R' an alkyl group. No. 2,181,929. James H. Werntz, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Manufacture mono-calcium phosphate monohydrate from dicalcium phosphate dihydrate. No. 2,181,933. Louis Block and Charles S. King, to Blockson Chemical Co., all of Joliet, Ill.

Manufacture a derivative of sebacic acid by treating a functional derivative of ricinoleic acid with alkali metal hydroxide or carbonate, at elevated temperature and pressure. No. 2,182,056. Herman A. Bruson and Lloyd C. Covert, to Rohm & Haas Co., all of Philadelphia, Pa.

Preparation salts of para-aminobenzenesulfonamide with aromatic sulfonic acids of the group including phenol-, benzene-, and salicyl-sulfonic acids. No. 2,182,075. Joseph Ebert, Westmont, N. J., to The Farastan Co., Philadelphia, Pa.

Preparation a jellylike oil and water colloidal suspension of aluminum silicate. No. 2,182,086. Charles E. Kraus, Sparks, Md.

Preparation a derivative of succinic acid comprising substitution in one of its methylene groups by a derivatized alkyl radical of at least 8 carbon atoms. No. 2,182,178. Walter Pinkernelle, Krefeld-Uerdingen, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Process hydrogenating aromatic hydrocarbons in a liquid solvent of the type including liquid ammonia and other alkylamines having solvent action upon alkali metals. No. 2,182,242. Charles B. Wooster, Providence, R. I., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture of bisphenols by reacting a phenol with a ketone in the presence of mineral acid. No. 2,182,308. Edgar C. Britton and Fred Bryner, to the Dow Chemical Co., all of Midland, Mich.

Production allylbenzene derivatives from the pyrolysis of secondary-butylbenzene derivatives. No. 2,182,313. Robert R. Dreisbach, to The Dow Chemical Co., all of Midland, Mich.

Preparation a non-toxic alkaline earth metal double salt of theobromine and gluconic acid. No. 2,182,314. Russel J. Fosbinder, Short Hills, N. J., to The Maltbie Chemical Co., Newark, N. J.

Preparation a salt-forming derivative of an alkyl thiobarbituric acid. No. 2,182,518. Arthur W. Dox, Windsor, Ontario, Canada, to Parke Davis & Co., Detroit, Mich.

Production of alkyl naphthenes, comprising reacting the naphthene base with a cycloparaffin of less than 5 carbon atoms, in the presence of a metal halide and a hydrogen halide. No. 2,182,557. Aristid V. Grosse, to Universal Oil Products Co., both of Chicago, Ill.

Manufacture a dry, crystalline beta-lactose. No. 2,182,618. Paul Francis Sharp and David Birney Hand, Ithaca, N. Y., to Cornell Research Foundation, Inc., Ithaca, N. Y.

Preparation carbocyclic hydroxyl alcohol esters of N-alkyl-piperidine-carboxylic acid. Nos. 2,182,791-2. Otto Dahmer and Claus Diehl, Darmstadt, Ger., to Merck & Co., Inc., Rahway, N. J.

Preparation a color-forming photographic developer, being a combination of an aromatic amino developing agent and a dicyanacetaminobisazole. No. 2,182,815. Edmund B. Middleton, Metuchen, and Andrew B. Jennings, New Brunswick, N. J., to Du Pont Film Manufacturing Corp., New York City.

Preparation alkalkyl triaryl phosphates, being high-boiling liquids. No. 2,182,817. Clarence L. Moyle, to The Dow Chemical Co., both of Midland, Mich.

Preparation halogenated androstenol compounds. No. 2,182,825. Arthur Serini, Berlin, Lothar Strassberger, Berlin-Wilmersdorf, and Willy Logemann, Berlin, Germany, to Schering Aktiengesellschaft, a corp. of Germany.

Preparation 3-keto-cyclopentanopolyhydrophenanthrenes. No. 2,182,920. Max Hartmann, Riehen, near Basel, and Albert Wettstein, Basel, Switzerland, to Society of Chemical Industry in Basle, Basel, Switzerland.

Preparation of activated vitamin-containing gelatine preparations in finely-divided form. No. 2,183,084. Stanton Reynolds, Greenford, Eng., to Atlantic Coast Fisheries Co., New York City.

Industrial Chemicals

Production carbohydrate fatty acid esters from starch by-product liquors. No. 21,291. Reissue. Sidney Mark Cantor, Riverside, Ill., to Corn Products Refining Co., New York City.

Production of dustless starch grits. No. 2,178,235. William John Lauterbach, Pekin, Ill., to Corn Products Refining Co., New York City.

Manufacture concentrated hydrogen peroxide solutions, comprising contacting a mixture of water and hydrogen peroxide vapors with aqueous hydrogen peroxide (at least 10% conc.), such that part of the peroxide vapor is condensed and a lesser proportion of water vapor condensed at the same time. No. 2,178,496. Heinrich Schmidt, Waldorf, Germany, to The Pennsylvania Salt Manufacturing Co., Philadelphia, Pa.

Production of aliphatic polyamines, comprising hydrogenating a polymerized aliphatic nitrile. No. 2,178,522. Anderson W. Ralston and Robert J. Vander Wal, to Armour & Co., all of Chicago, Ill.

Process modifying fatty oil products, comprising heating together a fatty oil and the polar compound paranitrophenol in a mutual organic solvent until a soluble modified product is formed, which is soluble in acetone, butyl acetone, and benzene. No. 2,180,342. Laszlo Auer, Budapest, Hungary, to J. Randolph Newman, Washington, D. C.

Preparation a catalyst for making ethyl chloride, comprising contacting a chlorinated aliphatic hydrocarbon with aluminum in the presence of a halogen-containing agent. No. 2,180,345. Robert D. Blue, to The Dow Chemical Co., both of Midland, Mich.

Preparation a vanadium catalyst, comprising associating a catalyst carrier with a compound prepared by reducing a pentavalent oxygen compound with a hydrohalide, and then igniting the mixture. No. 2,180,353. Harold B. Foster, Williamsville, N. Y., to National Aniline & Chemical Co., Inc., N. Y. City.

Manufacture calcium cyanamide, comprising passing a controlled flow of nitrogen through a revolving heated tube containing finely-divided calcium carbide, such that agglomeration of the particles is avoided. No. 2,180,382. Ernst Winter, Cologne-Braunsfeld, and Herbert Polack, Knapsack, near Cologne-on-the-Rhine, Germany, to Aktiengesellschaft fur Stickstoffdunger, Knapsack, near Cologne-on-the-Rhine, Germany.

Process recovering acetylene from gaseous admixtures by absorption in a solvent, and rectification of the acetylene-bearing fraction, with recovery of a pure acetylene-gas. No. 2,180,386. Frederick R. Balcar, Stamford, Conn., to Air Reduction Co., Inc., New York City.

Method recovering pure ethylene from a mixture containing also propylene, ethane, methane and hydrogen, comprising essentially fractional distillation, under pressure, of the gaseous admixture. No. 2,180,435. Joseph L. Schlitt, Darien, Conn., to Air Reduction Co., Inc., New York City.

Process and apparatus for recovering sulfur dioxide from mixtures of gases, comprising taking up the dioxide in a liquid absorbent of such a kind that a finely-divided solid becomes precipitated therein during the absorption cycle. No. 2,180,495. Raymond F. Bacon, Bronxville, N. Y.

Method recovering solvent in a process for concentrating acetylene obtained in the separation of it from gaseous admixtures by absorption in said solvent. No. 2,180,496. Frederick R. Balcar, Stamford, Conn., to Air Reduction Co., Inc., New York City.

Production highly active fuller's earth or clay, comprising mixing unground hydrous aluminum silicate and strong mineral acid with sufficient water to make a readily-flowable pulp therefrom, and heating the mixture under pressure such that the natural grain size of the silicate particles is preserved; the treated material is then washed free of soluble acids and salts. No. 2,180,576. Walter S. Baylis and William Kelley, Los Angeles, Calif., to Fullerite, Inc., a corp. of California.

Improved contact process for making sulfuric acid, comprising forming a mixture of SO_2 and O_2 and passing same through a series of heated catalytic materials of fixed cross-section. No. 2,180,727. Bernard M. Carter, Montclair, N. J., to General Chemical Co., New York City.

Process for sorptive carbon, comprising forming a composite body of carbonaceous material and a metal carbonate decomposable at about

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700° C., and then heating above 700° C. to progressively liberate carbon dioxide from said carbonate, which is non-uniformly distributed throughout the carbonaceous body. No. 2,180,735. Victor C. Hamister, Lakewood, Ohio, to National Carbon Co., Inc., a corp. of New York.

Method decolorizing clay suspensions containing ferric oxide as a color impurity, comprising reduction of the oxide to the colorless state, with subsequent addition of alkali metal polymetaphosphate sufficient to inhibit reversion of the iron to the ferric state. No. 2,180,742. Sanford C. Lyons, Bennington, Vt., to Bird Machine Co., Walpole, Mass.

Process making a pure caustic soda in conjunction with the ammonia-soda process, comprising essentially utilizing calcium chloride liquor and a carbonate to obtain lime and reacting the last with sodium carbonate and water to produce caustic soda and calcium carbonate, and returning the calcium carbonate to the process. No. 2,180,755. John C. Garrels and Howard Roderick, Grosse Ile, Mich., to Michigan Alkali Co., Wyandotte, Mich.

Production of anthracene, comprising contacting toluene with a catalyst at 500-700° C.; said catalyst being activated alumina containing a minor proportion of an oxide of chromium. No. 2,180,814. William J. Mattox and Aristid V. Grosse, to Universal Oil Products Co., all of Chicago, Ill.

Manufacture water-soluble titanium compounds from residual titanium-containing products from the clarification stage of a titanium oxide producing process. No. 2,180,961. Edward N. Kramer, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Production a dry, non-caking whey powder, wherein moisture is removed from the raw whey and the lactose caused to crystallize out to form the final product. No. 2,181,146. David D. Peebles, San Francisco, and Paul D. V. Manning, Berkeley Woods, Calif., to Western Condensing Co., San Francisco, Calif.

Preparation of butyric acid, comprising fermenting a molasses mash of sugar content about 4.59-8.52% and of pH about 6.8-7.0, with the action of *Clostridium saccharobutyricum*, at about 30-32° C.; calcium carbonate is present in excess of the amount necessary to neutralize the acid as formed; the acid derivative being recovered from the spent mash. No. 2,181,310. Rafael Arroyo, Rio Piedras, P. R., to Borinquen Associates, Inc., San Juan, P. R.

Method chlorinating nitromethane, comprising treating aqueous nitromethane with a medium containing chlorine and an alkali metal or alkaline earth hypochlorite. No. 2,181,411. Byron M. Vanderbilt, to Commercial Solvents Corp., both of Terre Haute, Ind.

Process manufacturing metal nitrates, wherein aqueous nitric acid and a metal chloride are heated to boiling, with evolution of nitrosyl chloride, water vapor, and chlorine; evolved chlorine derivatives are separated in aqueous nitric acid (over 40% conc.) by contact at 30° C. or lower, whereby only water vapor is absorbed by the acid solution, the other 2 gases being separately recovered. No. 2,181,559. Herman A. Beekhuis, Jr., Petersburg, Va., to The Solvay Process Co., New York City.

Process separating alumina from its ores, comprising treating the latter with a decomposing liquor containing alkali metal oxide and at least one alkali metal halide of the group: NaCl, KCl, NaBr, KBr; ratio of halide to oxide being about 1/3. No. 2,181,669. Rudolf Scholder, Karlsruhe, Germany.

Method carroting animal fur, comprising treating same with a solution of a protein coagulant of the type including phosphomolybdic and phosphotungstic acids. No. 2,181,884. Anthony Philip Giuliano, Newark, N. J.

Method waterproofing fibrous material, comprising treating it with a solution containing amphoteric metal salt, water-soluble soap and an alkaline solvent for same, the last being evaporatable at temperatures harmless to the material being treated, and a dehydrated alkali-metal phosphate. No. 2,182,045. Edward B. Bell, Lowell, Mass., to Hall Laboratories, Inc., Pittsburgh, Pa.

Manufacture a concentrated aqua ammonia from the reaction in a gas-tight chamber of ammonia sulfate crystals, lime, and an insufficient amount of water to dissolve the bulk of crystals; steam, passing through the chamber carries off the ammonia, which dissolves in the condensate to form the desired ammonia liquor. No. 2,182,078. Edward P. Fleming, Salt Lake City, Utah, and Melville F. Perkins, Woodbridge, N. J., to American Smelting & Refining Co., N. Y. City.

Production a soda soap grease, comprising viscous mineral oil and a soda soap of higher fatty, naphthenic, or mineral oil sulfonic acids, with which is incorporated a small amount of alkali metal salt of an aromatic carboxylate to prevent bleeding. No. 2,182,137. Vernon L. Ricketts, Martinez, Calif., to Shell Development Co., San Francisco, Calif.

Process recovering glycerine from spent soap lyes. No. 2,182,179. Ralph H. Potts, La Grange, and Edward W. Colt, Evanston, Ill., to Armour & Co., Chicago, Ill.

Process carbonating water with CO_2, avoiding appreciable increases in the temperature during the solvation action. No. 2,182,286. Henry W. Doennecke and Emory W. Douglass, Tulsa, Okla., and Carl O. Anderson, Baxter Springs, Kans., to Ozark Co., Tulsa, Okla.

Preparation of mixed triaryl phosphates. No. 2,182,309. Edgar C. Britton and Clarence L. Moyle, to The Dow Chemical Co., all of Midland, Mich.

Method processing fatty glyceride oils having in combination both lower and higher fatty groups, comprising displacing some of the lower radicals with higher groups having at least 2 more carbon atoms than those to be displaced, and recovering the displaced fatty acids. No. 2,182,332. George Barsky, New York City, to Wecoline Products, Inc., Boonton, N. J.

Process etherifying polyhydric alcohols in the presence of sulfuric or sulfonic acids. No. 2,182,397. Eddy W. Eckey, Wyoming, Ohio, to The Proctor & Gamble Co., Cincinnati, Ohio.

Method stabilizing monomeric vinyl acetate with a small amount of a rosin acid salt of a metal from the group including copper, magnesium, aluminum, and cobalt. No. 2,182,528. Gelu S. Stamatoff, Arlington, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Production of alcohol, acetone, and butanol from the bacterial fermentation of an amylaceous starting material. No. 2,182,550. Leo M. Christensen, Atchison, Kans., to The Chemical Foundation, Inc., New York City.

Production of hydrogen by treating finely-divided metal powder with water vapor in a closed, continuous process. No. 2,182,747. Walton H. Marshall, Jr., Nutley, N. J., to The M. W. Kellogg Co., New York City.

Continuous cyclic process for the solvent extraction and purification of animal and vegetable oils. No. 2,182,755. Benjamin Clayton, Houston, Tex., Walter B. Kerrick, Los Angeles, and Henry M. Stadt, Glendale, Calif., and Benj. H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev.

Method for solvent recovery of phosphatides from soap stock derived from phosphatide-containing vegetable oils. No. 2,182,767. Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev.

Process freshening the color of citrus fruits comprising first treating with sulfur dioxide, then with an alkaline compound lowering the acidity of the fruit surface, and then treating with an aldehyde compound. No. 2,182,965. John P. Ioannu, Philadelphia, Pa.

Process manufacturing butanol, acetone, and ethanol from garbage waste, comprising essentially fermentation of a prepared garbage mash with *Clostridium felsinae*. No. 2,182,989. James W. Jean, Pasadena, Calif.

Preparation polymeric esters by heating a polymethylene glycol with a dehydrogenation catalyst. No. 2,182,991. Wilbur A. Lazier, Wyckwood, Del., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Conversion a 1,2-olefin-dihalide with superheated steam to yield the corresponding aldehyde and a mono-halo-olefin. No. 2,183,036. James Lawrence Ames, to The Dow Chemical Co., Midland, Mich.

Purification of chlorinated aliphatic hydrocarbons by distilling with sulfur chloride, to remove unsaturated impurities. No. 2,183,046. John H. Reilly, to The Dow Chemical Co., both of Midland, Mich.

Production of isophorone, by contacting acetone vapor with a calcium compound. No. 2,183,127. Thomas H. Vaughn and Donald R. Jackson, Niagara Falls, N. Y., to Union Carbide & Carbon Research Labs., Inc., a corp. of New York.

Fermentation process for converting a pasteurized whey with lactose-fermenting bacteria, yielding ethanol as a principal product. No. 2,183,141. Willem Kauffmann and Pieter Johannis van der Lee, Amsterdam, Netherlands.

Production of hydrocarbons by catalytic treatment of carbon monoxide and hydrogen over an iron-containing catalyst. No. 2,183,145. Wilhelm Michael, Ludwigshafen-on-the-Rhine, and Wolfgang Jaeckh, Heidelberg, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Continuous production of acetaldehyde from acetylene gas. No. 2,183,148. Eger V. Murphree, Baton Rouge, La., to Standard Oil Development Co., a corp. of Delaware.

Polymerization of ethylene in the presence of a liquid paraffin hydrocarbon or chlorine derivative thereof, containing also aluminum chloride and a small amount of water. No. 2,183,154. Johann Sixt, Munich, Germany, to Consortium Fuer Elektrochemische Industrie, G.m.b.H., Munich, Germany.

Method treating natural salt with a small proportion of sorbitol, thereby preventing caking in the refined salt product. No. 2,183,173. Marnell Segura, Jefferson Island, La., to Jefferson Island Salt Mining Co., Louisville, Ky.

Production of vinyl halide, by adding a hydrogen halide to acetylene in the presence of a mercuric halide. No. 2,183,240. Karl Jung, Rheinfelden in Baden, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Recovery of carbon dioxide by continuously contacting with an alkali carbonate solution saturated with alkali bicarbonate. No. 2,183,324. Gustave T. Reich, Philadelphia, Pa.

Oxidation of unsaturated aldehydes to the corresponding acids by treating with oxygen in the presence of a per- compound of an organic acid miscible with the aldehyde. No. 2,183,325. Hanns Peter Staudinger, Ewell, Eng., to The Distillers Co. Ltd., Edinburgh, Scotland.

Pyrolytic production of alpha-beta-unsaturated monobasic aliphatic acids, from a secondary or tertiary alcohol derivative of a cyano-, carbamyl-, or lower carboalkoxy compound. No. 2,183,357. Patrick Dunbar Ritchie, David Trevor Jones, and Robert Burns, Saltcoats, Scotland, to Imperial Chemical Industries Ltd., a corp. of Great Britain.

Process breaking emulsions with a bleached castor oil that has been blown at about 285° F., and then modified with an aldehyde-reactive reagent. No. 2,183,487. Ivor M. Colbeth, East Orange, N. J. to The Baker Castor Oil Co., New York City.

Production of amines of alkyl and cycloalkyl halides by ammonolysis. No. 2,183,499. Lee H. Clark and John F. Olin, Grosse Ile, and Charles W. Deibel, Wyandotte, Mich., to The Sharples Solvents Corp., Philadelphia, Pa.

Method polymerizing olefins in the presence of boron fluoride and water. No. 2,183,503. Ambrose McAlevy, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Metals, Alloys

Ferrous alloy having high creep strength and corrosion resistance under elevated temperature and pressure, containing 2-3.25% chromium, 0.9-1.75% molybdenum, and carbon below 0.20%. No. 2,182,177. Harold D. Newell, Beaver Falls, Pa., to The Babcock & Wilcox Tube Co., West Mayfield, Pa.

Production double fluorides of aluminum and alkali metals, comprising treating a hydrofluoboric acid solution with alkali metal aluminate and an alkali metal compound. No. 2,182,509. Harold W. Heiser, East St. Louis, Ill., to Aluminum Co. of America, Pittsburgh, Pa.

Extraction of fluorides from fluorspar, comprising digesting the ore with sulfuric acid and a borate. No. 2,182,511. Harold W. Heiser, East St. Louis, Ill., to Aluminum Co. of America, Pittsburgh, Pa.

Production of iron-free titanium dioxide concentrates, comprising mainly heating the oxidized ore with gaseous hydrogen chloride at 600-800° C. No. 2,183,365. James Eliot Booge, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Method treating carbonaceous furnace waste from the electric furnace production of aluminum, to recover the cryolite therefrom. No. 2,183,500. Bruce D. Crawford, Grass Valley, Calif., to American Cyanamid Co., a corp. of Maine.

Process recovering tantalum and niobium values from ores containing same by smelting with a flammable metal of the type including aluminum, magnesium, and calcium. No. 2,183,517. Joseph Pierre Leemans, Hoboken, near Antwerp, Belgium to Société Générale Métallurgique de Hoboken, Hoboken, near Antwerp, Belgium.

Naval Stores

Production of terpineol from pinene, comprising treating the latter with dilute aqueous acid of the class including polybasic non-carboxylic acids and the monoaryl and monoalkyl derivatives thereof, in the presence of an inert, mutual solvent. No. 2,178,349. Donald H. Sheffield, Brunswick, Ga., to Hercules Powder Co., Wilmington, Del.

Process making rosin size and continuously recovering turpentine, from a resinous raw material. No. 2,178,532. Benjamin H. Thurman, Bronxville, N. Y., to Refining, Inc., Reno, Nev.

Purification of wood rosin, comprising contacting a solution of the rosin with a magnesium silicate (MgO/SiO_2 being between 1/1.25 and 1/1.60), and then removing the solution of purified rosin. The adsorbent

body is washed clean first with petroleum naphtha, then alcohol, and finally with the rosin solvent. No. 2,181,791. Robert E. Price, Picayune, Miss., to Crosby Naval Stores, Inc., Picayune, Miss.

Manufacture terpene ethers by reacting a monobasic alcohol with an unsaturated group in the terpene nucleus. No. 2,182,826. Donald H. Sheffield, Brunswick, Ga., to Hercules Powder Co., Wilmington, Del.

Paper & Pulp

Continuous process for a semipulp from straw. No. 2,178,266. Umberto Pomilio, Rome, Italy, to Pomilio Corp. Ltd., London, England.

Manufacture purified wood cellulose suitable for making chemical derivatives thereof, comprising chlorine conversion of unbleached wood sulfite pulp into a network of activated cellulose, rendered permeable by a final treatment with boiling dilute caustic soda solution. No. 2,180,517. Lionel Elmer Goff, Alton, Ill., to The Cellulose Research Corp., East Alton, Ill.

Manufacture a nitrocellulose from a mercerized paper pulp. No. 2,181,911. George A. Richter, Berlin, N. H., to Brown Company, Berlin, N. H.

Method recovering solids from waste pulp mill liquors, comprising spraying the liquor into a chamber containing heated heat transfer liquid at a temperature sufficient to evaporate the water, the solids and heat transfer liquid being continuously removed through the bottom of the chamber. No. 2,182,428. Erling Fladmark, Lawrence, Mass.

Process for grinding a highly resinous wood pulp, comprising adding barium hydroxide to the pulp during the grinding, such that a barium resin acid soap is precipitated. No. 2,182,520. Kurt Schwabe, Kriebstein, Post Waldheim in Saxony, Germany, to Kubler & Niethammer, Kriebstein, Post Waldheim in Saxony, Germany, and Chemische Fabrik Coswig Anhalt, G.m.b.H., Coxwig in Anhalt, Germany.

Method recovering cellulose ethers from paper coated with same, comprising digesting the paper slurry in aqueous alkali at a temperature at which the ether is water-insoluble, and separating the ether from the aqueous slurry. No. 2,183,039. Richard D. Freeman, to The Dow Chemical Co., both of Midland, Mich.

Process for reclaiming the valuable constituents from waste waxed papers, comprising emulsifying the hot, aqueous "broke" with a sulfonated material to separate the waxy components. No. 2,183,259. Arnold M. Hill, Orange, N. J., to National Oil Products Co., Harrison, N. J.

Petroleum

Treatment raw gasoline distillates, comprising heating such a mixture under pressure with a solid, finely-divided adsorbent, and recovering the by-products by fractionation. No. 21,299. Reissue. Rudolph C. Osterstrom, Kenilworth, Ill., to The Pure Oil Co., Chicago, Ill.

Method dewaxing a wax-bearing oil, comprising heating the oil in the presence of a soap, said soap being a water-insoluble product tending to modify wax crystallization, to about 180° F., chilling, and then removing the precipitated wax. No. 2,170,328. Le Roy G. Story, White Plains, N. Y., to The Texas Co., N. Y. City.

Production alkaline earth salts of alkyl sulfates, comprising treating at 60-120° C. a sulfuric acid-containing alkyl sulfate of at least 7 carbon atoms, with a basic alkaline earth metal compound in the presence of sufficient acetone to precipitate crystalline alkaline earth metal sulfate. No. 2,176,005. Anton Johan Tulleners, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Method yielding ethers from olefins, comprising contacting a paraffinic olefin mixture with aqueous olefin-hydrating acid catalyst under fixed conditions of temperature and pressure. No. 2,178,186. Charles F. Oldershaw, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Process for solvent refining of high-grade paraffin base lubricating oil, comprising forming a raffinate phase with a mixture of chlorophenols of the benzene series. No. 2,178,321. Louis A. Clarke, Fishkill, N. Y., to The Texas Company, New York City.

Cracking process, producing gasoline-type hydrocarbons from mixtures of higher and lower boiling hydrocarbons. No. 2,178,329. Le Roy G. Story, White Plains, N. Y., to The Texas Company, New York Cit

Manufacture a gasoline having increased anti-knock properties, containing a quantity of volatile unsaturated aliphatic alcohol or ether. No. 2,178,403. Irving E. Muskat, Barberton, Ohio, to Pittsburgh Plate Glass Co., a corp. of Pennsylvania.

Production olefin oxides by catalytic oxidation of lower olefins with oxygen, in the presence of platinum or palladium, at 150-500° C. No. 2,178,454. Karl Metzger, Ludwigshafen-on-the-Rhine, and Leonid Andrussow, Mannheim, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Preparation a lubricating mineral oil, containing a small amount of a nitroso compound of the benzene series. No. 2,178,455. John M. Musselman, to The Standard Oil Co., both of Cleveland, Ohio.

Process recovering pyridine in the solvent-refining method of purifying wax-bearing hydrocarbon oils. No. 2,178,506. James W. Weir, Los Angeles, Calif., to Edeleanu Gesellschaft, m.b.H., Berlin, Germany.

Method refining hydrocarbon oils to improve the viscosity thereof, comprising extraction with a mixture containing acetanilide in major amount at a temperature at which paraffinic and non-paraffinic hydrocarbons can be separated into two different layers. No. 2,178.515. Ernest Terres, Berlin, Germany, and Josef Moos, New York, and Erich Saegebarth, Jackson Heights, N. Y., to Edeleanu Gesellschaft, m.b.H., Berlin, Germany.

Method circulating materials in the polymerization of unsaturated hydrocarbons, and the fractional separation of the intermediate products thereof. No. 2,180,361. Raymond Charles Lassiat, Swarthmore, Pa., to Houdry Process Corp., Wilmington, Del.

Production high knock rating gasoline from heavy hydrocarbon oil, comprising essentially a cracking process. No. 2,180,372. Bernard H. Shoemaker, Hammond, Ind., to Standard Oil Co., Chicago, Ill.

Conversion normally gaseous hydrocarbons into organic materials of higher molecular weight, comprising passing said hydrocarbons admixed with oxides of carbon into contact with a catalytic body at 150-350° C. whereby the mixed oxides and hydrocarbons react to yield the said materials, substantially all hydrocarbons of higher molecular weight. No. 2,180,672. Frederick E. Frey, Bartlesville, Okla., to Phillips Petroleum Co., a corp. of Delaware.

Production a normally liquid, essentially non-aromatic hydrocarbon product from a wax-bearing hydrocarbon mixture which has been extracted with a selective solvent for aromatic hydrocarbons. No. 2,180,763. Gerritt Willem Nederbragt, Amsterdam, Netherlands, to Shell Development Co., San Francisco, Calif.

Preparation of halogen derivatives of a substantially saturated linear hydrocarbon polymer of the aliphatic series, of a M. W. over 1000 and having a plurality of short alkyl side chains. No. 2,181,144. Arnold J. Morway, Roselle, and Floyd L. Miller, Roselle Park, N. J., to Standard Oil Development Co., a corp. of Delaware.

Preparation an oxidized, chlorinated olefin polymer, comprising polymerizing and iso-olefin, oxidizing, and then chlorinating said polymer. No. 2,181,158. William J. Sparks, Cranford, and Clifford W. Muessig, Elizabeth, N. J., to Standard Oil Development Co., a corp. of Del.

Conversion gaseous hydrocarbons to liquid hydrocarbons of the gasoline-boiling type, comprising essentially a continuous treatment of partially liquefied gas with liquid absorbent media. No. 2,181,302. Percival C. Keith, Jr., Peapack, N. J., George W. Robinson, Houston, Tex., and George Roberts, Jr., Montclair, N. J., to The Polymerization Process Corp., Jersey City, N. J.

Dispersing agent, comprising the reaction product of black sulfuric acid with a spent alkaline petroleum-refining neutralizing agent of the class including caustic soda and sodium carbonate; said dispersant being sparingly soluble in mineral oils and very soluble in water, and having marked dispersing and emulsifying properties. No. 2,181,449. Arthur E. Catanach and Eric Kolthoff, Port Arthur, Tex., to Gulf Oil Corporation, Pittsburgh, Pa.

Preparation a clear, homogeneous material, being the cellulose ester of an aliphatic acid and not more than about 20% of a substantially saturated aliphatic iso-olefin polymer of M. W. averaging above 800 by the viscosity method. No. 2,181,609. Robert P. Russell, Short Hills, N. J., to Standard Oil Development Co., a corp. of Delaware.

Process recovering gasoline from natural gas, comprising continuous recovery of part of the gasoline in an absorption oil through which the gas is passed, and recovering the gasoline from the oil. No. 2,181,633. Arthur John Lindsay Hutchinson, Palo Alto, Calif., to The Fluor Corporation, Ltd., Los Angeles, Calif.

Method dewaxing a mixture of waxy oil and dewaxing solvent having mixed with it a small amount of water, comprising incorporating in the mixture a chromium soap of a higher fatty acid, chilling, and separating the precipitated wax. No. 2,181,638. Leon W. Cook, Beacon, N. Y., to The Texas Co., New York City.

Process for interpolymerization of a tertiary olefin with a dissimilar olefin of lesser reactivity, comprising heating the former with an excess of the latter, in the presence of an acidic polymerization catalyst at elevated temperature and pressure. No. 2,181,640. Richard M. Deanesly and Aaron Wachter, Berkeley, Calif., to Shell Development Co., San Francisco, Calif.

Manufacture di-isobutylene from an unsaturate of the butane series containing isobutylene, comprising separating the last while in the liquid phase, with dry HCl, and then thermally decomposing the tert-butyl chloride recovered therefrom, to regenerate isobutylene, which is catalytically polymerized; the byproduct HCl is then recycled. No. 2,181,642. Wallace A. McMillan, Beacon, N. Y., to The Texas Co., a corp. of Del.

Process converting hydrocarbon gases containing 40-60% olefins into liquid hydrocarbons rich in toluol, comprising subjecting said gases to temperatures within the range 1125-1175° C., at superatmospheric pressure, for a period of 5-30 seconds, such that carbon formation is at a minimum. No. 2,181,749. Cary R. Wagner, to The Pure Oil Co., both of Chicago, Ill.

Process improving the anti-knock properties of a hydrocarbon fuel gas, comprising essentially contacting said gas with a body of Brucite at elevated temperatures. No. 2,181.877. Harry E. Drennan, Whittenburg, Tex., to Phillips Petroleum Co., a corp. of Delaware.

Preparation a higher-boiling hydrocarbon oil containing a small amount of aryl metallo-organic compound having an alkyl group attached to a metallic element thereof, said alkyl and aryl groups being connected by carbon atoms to the same metallic atom. No. 2,181,914. Raphael Rosen, Cranford, N. J., to Standard Oil Development Co., a corp. of Delaware.

Manufacture a gasoline from the sulfuric acid (90% conc.) condensation of a mixture of propylene and butylene gases, at subnormal pressure. No. 2,181,942. Vladimir N. Ipatieff and Herman Pines, to Universal Oil Products Co., all of Chicago, Ill.

Electrocoalescent method for purifying a mineral oil containing water. No. 2,182,145. Harold C. Eddy, Los Angeles, Calif., to Petrolite Corp. Ltd., Wilmington, Del.

Recovery of carbon dioxide from the lower, gaseous hydrocarbons, comprising contacting the liquified gases with aqueous tripotassium phosphate, whereby the CO_2 is absorbed, and later discharged by passing steam through the phosphate-carbonate solution. No. 2,182,305. Ludwig Rosenstein, San Francisco, Calif., to Shell Development Co., San Francisco, Calif.

Process dehydrogenating hydrocarbons without decomposition, comprising essentially passing the hydrocarbons over an activated alumina. No. 2,182,431. Herbert P. A. Groll, Berkeley, and James Burgin, Oakland, Calif., to Shell Development Co., San Francisco, Calif.

Continuous process for converting and coking hydrocarbon oils. No. 2,182,599. Jean Delattre Seguy, to Universal Oil Products Co., both of Chicago, Ill.

Polymerization a normally gaseous olefin of at least 3 carbon atoms. No. 2,182,617. Richard Michel, Krefeld-Uerdingen, Germany, to I. G. Farbenindustrie Aktiengesel., Frankfort-on-the-Main, Germany.

Preparation a lubricating oil composition containing a small proportion of halogenated oxidation product of a hydrocarbon, the alcohols and acids in said product being esterified. No. 2,183,294. Bert H. Lincoln, Ponca City, Okla., and Alfred Henriksen, deceased, late of Ponca City, Okla., by John W. Wolfe, administrator, to The Lubri-Zol Development Corporation, Cleveland, Ohio.

Pigments

Stabilized metal paste pigment, having improved persistence of leafing power, comprising metal flakes, leafing agent, and an aromatic phenol of the benzene series. No. 2,178,179. Edwin L. McMahan, New Kensington, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Metal paste pigment having improved leafing qualities, said pigment containing a naphthol. No. 2,178,180. Edwin L. McMahan, New Kensington, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Metal paste pigment having improved leafing qualities, containing an organic amine. No. 2,178,181. Edwin L. McMahan, New Kensington, Pa., to Aluminum Co. of America, Pittsburgh, Pa.

Manufacture a carbon black in granular form, containing sufficient fixed alkali to produce an aqueous sludge pH of 6.0-9.0, said alkali being tenaciously held after repeated washings with water; said alkali being free of

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added sulfur acids, selenium, tellurium, and halogen. Nos. 2,178,382-3. William B. Wiegand, Old Greenwich, Conn., to Columbian Carbon Co., N. Y. City.

Method improving the degree of compressibility of a powdered metal. No. 2,181,123. Joseph E. Drapeau, Jr., Calumet City, Ill., and Louis G. Klinker, Hammond, Ind., to The Glidden Co., Cleveland, O.

Process for washing precipitated zinc sulfide pigment, comprising first a water wash, followed by treating the partly-purified pigment precipitate with a base, finally washing free with water, and then calcining the pigment material No. 2,181,651. John Henry Calbeck, Joplin, Mo., to American Zinc, Lead & Smelting Co., St. Louis, Mo.

Manufacture a colored powder having as its major coloring component a water-insoluble azo color; sufficient of the individual color particles being coated with an autodispersibility-producing "agent" such that the powder as a whole has an autodispersibility of at least 75% and a total dispersibility of at least 90%. Product is substantially free from aggregates in the total dispersion visible as discrete particles by the naked eye. No. 2,181,800, Moses L. Crossley, Plainfield, Roy H. Kienle, Bound Brook, N. J., and Alfred L. Peiker, East Bound Brook, N. J., to The Calco Chemical Co., Inc., Bound Brook, N. J.

Manufacture a calcium carbonate coating pigment for paper and the like. No. 2,182,096. Howard Roderick, Grosse Isle, Mich., to The Michigan Alkali Co., Wyandotte, Mich.

Manufacture titanium dioxide from ilmenite, comprising digestion of the ore with sulfuric acid, clarifying, and forming a basic soluble sulfate hydrolyzable to yield the dioxide in purified form. No. 2,182,420. Benjamin Wilson Allan and L'Roche G. Bousquet, to The American Zirconium Corp., all of Baltimore, Md.

Method treating a livering red lead with carbon dioxide to inhibit livering action with acid paint vehicles. No. 2,182,436. James O. Johnstone, East Chicago, Ind., to The Glidden Co., Cleveland, Ohio.

Preparation a lead oxide composition containing 5-15% lead sulfate as a coating on individual particles of oxide. No. 2,182,479. James O. Johnstone, East Chicago, Ind., to The Glidden Co., Cleveland, Ohio.

Resins, Plastics, etc.

Production condensation products of crotonaldehyde, comprising condensing crotonaldehyde by means of alkali alcoholates and hydrogenating the resulting condensates. No. 2,178,523. Willi Schmidt, Julius Thewalt, and Alexander Rothhaas, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Production a thermoplastic solid, comprising subjecting acid casein to action of a benzyl compound in the presence of ethanol and alkali carbonate, with controlled heating treatment. No. 2,180,626. Jean Delorme, Aubiere, France, to George Morrell Corp., Muskegon, Mich.

Manufacture a paint and tile base, comprising a self-compatible oxidized mixture of an oxidizable drying oil and an oily aromatic substance composed chiefly of dimers of coumarone and indene. No. 2,180,729. Frank W. Corkery, Crafton, Pa.

Manufacture a permanently fusible phenol-aldehyde resin, comprising reacting a phenol and an aldehyde in the presence of an acid catalyst, partly dehydrating the product of reaction, and neutralizing the residue, and finally removing substantially all the water. No. 2,180,981. Edmond F. Fiedler, Adams, Mass., to General Electric Co., a corp. of New York.

Production a synthetic, thermoplastic resinous material, comprising esterifying a polyhydric alcohol with an aliphatic hydroxy-carboxylic acid, and reacting this ester with a polycarboxylic acid to react with all free residual hydroxyl groups. No. 2,181,231. Philip H. Groggins, John T. Stearn, and Benjamin Makower, Washington, D. C.

Heat-stable, resinous composition comprising a vinyl resin containing a vinyl halide and a stabilizer, the last being a mixture of metal stearate and an alkali metal salt of a monobasic aliphatic acid. No. 2,181,478. Kermith K. Fligor, Lakewood, Ohio, to Carbide & Carbon Chemicals Corp., a corp. of N. Y.

Production polymers from the interaction of diurethane and a lower alkyl diamine compound. No. 2,181,663. Elmore Louis Martin, to E. I. du Pont de Nemours & Co., both of Wilmington, Del.

Manufacture a hard, rigid, solid resinous mass free from internal voids or bubbles, being the copolymer of styrene with 1-10% allyl methacrylate. No. 2,181,739. Winton I. Patnode, Schenectady, N. Y., to General Electric Co., a corp. of New York.

Polymerization of 1,2-dihydronaphthalene by contacting with an addition compound of an alkali metal and a polycyclic aromatic hydrocarbon; said polymer being a substantially infusible solid. No. 2,181,770. Norman D. Scott, Sanborn, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Polymerization of styrene by contacting with the addition compound of an alkali metal and a polycyclic aromatic compound. No. 2,181,771. Norman D. Scott, Sanborn, N. Y., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Manufacture a silicon-modified phenolic resin, wherein the modifier is an organic silicon compound of the type: alkyl orthosilicate; silicon tetrahalide; alkyl silicon halide; or aryl silicon halide. No 2,182,208. Howard K. Nason, St. Louis, Mo., to Anderson-Stolz Corp., Kansas City, Mo.

Production viscous to waxy polymers of ethylene imines. No. 2,182,306. Heinrich Ulrich, Ludwigshafen-on-the-Rhine, and Walter Harz, Dormagen, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Preparation an interpolymerization product of a fumaric acid ester and isobutylene. No. 2,182,316. Heinrich Hopff and Gustav Steinbrunn, Ludwigshafen-on-the-Rhine, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Production of plastic isobutylene polymers having a weight above about 1000. No. 2,182,512. John A. Anderson, Olympia Fields, Ill., to Standard Oil Co., Chicago, Ill.

Production cyclic formaldehyde acetals from the interaction of aqueous formaldehyde and alpha-alkylene oxide in the presence of an acid-reacting halogen compound. No. 2,182,754. Kurt Billig, Frankfort-on-the-Main-Hochst, Germany, to I. G. Farbenindustrie Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Rubber

Rubber mixtures for use in the manufacture of rubber goods, comprising rubber and unsaturated hydrocarbons of the formula type $(C_3H_4)_n$, the latter being viscous higher polymers compatible with rubber in all proportions, soluble in sulfuric acid and highly reactive with sulfur. No. 2,180,367. Fritz Rostler and Vilma Mehner, Vienna, Austria, to Naftolen-Gesellschaft zur Verwertung der Rostler-Mehner'schen Verfahren m.b.H., Vienna, Austria.

Rubber preservative, being the composite obtained by reacting a primary aromatic amine with a saturated monobasic aliphatic hydrocarbon alcohol at 275-300° C. for 7-15 hours. No. 2,180,666. Albert M. Clifford, Stow, Ohio, to Wingfoot Corp., Wilmington, Del.

Compound retarding rubber deterioration, comprising a terpene-aryl secondary amine or a hydroxy-terpene-aryl primary or secondary amine. No. 2,180,936. Raymond F. Dunbrook, to The Firestone Tire & Rubber Co., both of Akron, O.

Rubber mixture, comprising raw rubber and an emulsion of water and a higher fatty alcohol having 12-18 carbon atoms. No. 2,181,426. Georg Goll and Ernst Helft, Berlin, Germany, to Duetsche Hydrierwerke Aktiengesellschaft, Berlin-Charlottenburg, Germany.

Method vulcanizing rubber, comprising incorporating with a vulcanizable rubber an accelerator, the last being the reaction product of an aliphatic amine with an aliphatic aldehyde (ratio, 1 mol/2 mols, resp.) at −20° C. to $\pm$5° C. No. 2,181,454. Henri Martin Guinot, Niort, Deux-Sevres, France, to Les Usines de Melle, Melle, France.

Manufacture a regenerated cellulose fiber coated with rubber, containing a small amount of a hydroxyalkylamine to increase the adhesion to the fiber of the rubber. No. 2,181,538. Joseph I. Taylor, Elizabethton, Tenn., to North American Rayon Corp., N. Y. City.

5-methylamino-1,3,2-xylenol, as a rubber preservative compound; said amino radical being a member of the group: piperidino-, morpholino- and dialkylamino-radicals, each alkyl group having 1-4 carbon atoms. No. 2,181,719. William Baird and Maldwyn Jones, Blackley, Manchester, England, to Imperial Chemical Industries Limited, a corp. of Great Britain.

Preparation an aluminum-free fatty acid-rubber complex formed in the presence of aluminum chloride; said rubber ingredient being an unvulcanized material. No. 2,182,180. Anderson W. Ralston and William M. Selby, to Armour & Co., all of Chicago, Ill.

Process for chlorinating rubber, comprising dissolving rubber in carbon tetrachloride and passing chlorine into the solution to obtain finally a chlorinated rubber of at least 64% chlorine and having a viscosity greater than about 20 centipoises. No. 2,182,456. William H. Stevenson, Parlin, N. J., to Hercules Powder Co., Wilmington, Del.

Method producing a chlorinated rubber having an apparent density of at least 15 lbs./cu. ft. when dry. No. 2,182,473. Walter E. Gloor, Highland Park, N. J., to Hercules Powder Co., Wilmington, Del.

Method treating unvulcanized rubber with a small proportion of alpha-nitroso-beta-naphthol, thereby producing a rubber of decreased resistance to flow. No. 2,183,342. Ira Williams, Woodstown, and Carroll Cummings Smith, Carneys Point, N. J., to E. I. du Pont de Nemours & Co., Wilmington, Del.

Textiles

Process for dry-cleaning a fabric having a water-insoluble cellulose ether impregnation as a conditioner; method uses dry-cleaning solvents removing also the treating material, which is replaced substantially by a final dip in a volatile organic solvent containing a quantity of a water-insoluble cellulose ether, whereby the original qualities of the fabric are substantially restored. No. 2,181,691. Edmond H. Bucy, Stamford, Conn., to Atlas Powder Co., Wilmington, Del.

Method sizing rayon threads, yarns, etc., with a stable, insoluble, highly acetylated saccharide; product being removable after weaving. No. 2,182,887. Ernst von Lippmann, Chemnitz, Germany, to Bohme Fettchemie-Gesellschaft m.b.H., Chemnitz, Germany.

Process for dyeing rayons with a vat dyestuff dissolved in an organic base, substantially in the absence of aqueous media. No. 2,182,963. Henry Dreyfus, London, and Robert Wighton Moncrieff, Spondon, near Derby, Eng., to Celanese Corp. of America, a corp. of Delaware.

Method sizing a textile fabric with water-insoluble resin containing carboxylic acid groups; said resin being made water-soluble by treating with a urea compound. No. 2,183,226. Herbert Rein, Leipzig, Germany, to I. G. Farbenindustrie, Aktiengesellschaft, Frankfort-on-the-Main, Germany.

Water, Sewage, etc.

Method and apparatus for destroying sewage by mixing with granular refractory material and subjecting the mass to the action of heat in a retort. No. 2,183,463. Henry H. Moreton, Montclair, N. J.

Abstracts of Foreign Patents

This issue carries our first monthly summary, in abstract form, of patents granted in Canada, England, France and Belgium. The latest available data will be published, but it will be understood that some delay will occur as a result of present conditions in Europe. We shall begin reporting German patents as soon as we are sure of uninterrupted service.

To assist those making use of this summary, it might be well to comment briefly on the system used by each of these countries in reporting patents.

Canada grants the patent on the date of publication. It does not print the patents, but supplies typewritten certified copies at a cost averaging about five dollars each.

English "patents" here reported are known as *Complete Specifications Accepted* and are open to opposition by interested parties for a period of two months from date of publication. Printed copies may be obtained at 1 s. 6 d. each.

French patents are granted several months before publication, and the printed report issues several days or even weeks afters its date. Printed copies may be obtained at 10 francs each.

Belgian patents, like French, are granted long before publication. The report comes out 12 times each year, and photostatic copies of a single page can be obtained at from 3.50 to 4.50 francs per page.

It is hoped that our readers will find this service as valuable as our abstracts of U. S. patents have proved to be. We shall be glad to receive comments or criticisms.

CANADIAN PATENTS GRANTED ON DECEMBER 5, 1939

Process of contacting dolomite with molten inorganic compound substantially inert to constituent carbonates at temperatures above decomposition of $MgCO_3$ and below $CaCO_3$. No. 385,398. Harold S. Booth, Cleveland Hts., Ohio.

Solvent thinner obtained by reacting vegetable distillates, mineral oil, and by-products from starch, alcohol, or sugar manufacture, with acetylene. No. 385,415. Dimiter Ivanoff Ousheff, Buffalo, N. Y.

Textured fibre board composed mainly of vegetable fibres, and haphazard raised areas on its surface formed from fibres during manufacture. No. 385,443. Canadian Gypsum Co., Ltd., Windsor, N. S.

Production of acetylene and substantially dry calcium hydrate from calcium carbide. No. 385,463. Dominion Oxygen Co., Ltd., Toronto, Ont.

Corrosion resistant steel for saline solutions composed of austenitic steel containing 16-30% Cr, 7-20% Ni, 2-5% Mo, 1.5-5% Mg, less than 0.2% C, less than 1% Si, balance Fe. No. 385,465. Electro Metallurgical Co. of Canada, Ltd., Toronto, Ont.

Manufacture of zinc carbonate and oxide. No. 385,468. Hughes-Mitchell Processes, Inc., Torrance, Calif.

Manufactured dairy product containing milk, a water soluble alginate compound and a water soluble gum. No. 385,473. Kelco Co., Los Angeles, Calif.

Concentration of metalliferous ores by froth flotation with the aid of a xanthomolybdic acid compound. No. 385,474. Minerals Separation North American Corporation, New York, N. Y.

Preparation of aryl-stibonic acid compounds containing the thiocarbamido group by reacting amino-aryl-stibinic acid or its salt with an aryl-thiocarbimido compound containing a salt forming group. No. 385,-475. Parke, Davis & Company, Detroit, Mich.

Manufacture of rubber chloride. Nos. 385,477 to 385,480 inclusive. The Raolin Corp., Charleston, W. Va.

Method and apparatus for coating base material with a plastic film. No. 385,484. Reynolds Research Corp., New York, N. Y.

High temperature alloy containing 10-25% Cr, 7-15% Ni, 2-4% W, 0.7-3% Mo, 0.03-0.2% C and balance Fe. No. 385,485 (see also Nos. 385,486 to 385,488 inclusive and Nos. 385,514 to 385,516 inclusive). Rustless Iron and Steel Corp., Baltimore, Md.

Process for dyeing by means of water soluble acyl derivatives of sparingly soluble dyestuffs. No. 385,491. Society of Chemical Industry in Basle, Basel, Switzerland.

Solvent refining of residual lubricating oil stock containing asphaltic and dark-colored constituents with a mixture of furfural and mixed chlorphenols. No. 385,496. Texaco Development Corp., Wilmington, Del.

Purification of exhaust gases for reuse comprising reducing treatment, oxidizing treatment, and contacting with activated carbon. No. 385,505. Michael M. Jalma and Henri Coutinho, New York, N. Y.

CANADIAN PATENTS GRANTED ON DECEMBER 12, 1939

Production of transparent films from a solution of a soluble alginate with a viscosity of not less than 10 centipoises in a 1% solution. No. 385,527. Cyril Wilfred Bonniksen, Maidenhead, Berk., England.

Separation of constituents of pyroligneous acid. No. 385,531. Jesse M. Coahran, Smithport, Penna.

Ore smelting process. No. 385,562. Richard Rodrian, Denver, Colo.

Cement clinker producing apparatus. No. 385,571. Henry Vanderwerp, Cleveland, O.

Production of highly reflective aluminum surfaces. No. 385,578. Aluminum Laboratories, Ltd., Montreal, P. Q.

Exhausting and gas filling machine. No. 385,592. Canadian General Electric Co., Ltd., Toronto, Ont.

Method and apparatus for producing aryl phosphates. No. 385,599. Celluloid Corp., Newark, N. J.

Foot deodorant pad comprising multiple sheets of cellulose material and sublime deodorant substance. No. 385,614. Foot Filter, Inc., Jersey City, N. J.

Edible cereal product processes at 85-90 lb./sq. in. and 300-340° F., with sudden release of pressure to expand farinaceous material without expanding the bran and wheat germs. No. 385,615. General Mills, Inc., Minneapolis, Minn.

Production of large-crystal ergosterol. No. 385,616. General Mills, Inc., Minneapolis, Minn.

Production of benzilic acid ester of pseudotropine by reacting pseudotropine with benzilic acid in presence of strong acids. No. 385,630. Merck & Co., Inc., Rahway, N. J.

Caustic alkali metal refining process. No. 385,631. National Lead Co., Brooklyn, N. Y.

Treatment of waste cellulose lye. No. 385,632. Norsk Hydro-Elektrisk Kvaelstofaktieselskab, Oslo, Norway.

Impregnation of fibrous materials with a system comprising rubber latex, an alkali metal salt of polybasic weak acid as stabilizer, and an antifoaming agent compatible with said system. No. 385,638. Raybestos-Manhattan, Inc., Bridgeport, Conn.

Desulfurizing process for mineral oils. No. 385,640. Shell Development Co., San Francisco, Calif.

Process of forming vulcanized rubber and shellac composition. No. 385,657. William Zinsser & Co., Inc., New York, N. Y.

ENGLISH COMPLETE SPECIFICATIONS ACCEPTED NOVEMBER 29, 1939

Open to opposition for two months from above date

Acid anthraquinone dyestuffs. No. 514,774. Imperial Chemical Industries, Ltd.

Preparation of phosphorous-containing organic compounds useful as interface modifying agents. No. 514,721. Emulsol Corporation.

Method and composition for treating coal. No. 514,671. Johnson March Corp

Manufacture of organic acids and metal salts and esters thereof. No. 514,619. Imperial Chemical Industries, Ltd.

Manufacture of cyanine dyes and their use in modifying the properties of photographic emulsions. No. 514,621. Kodak, Ltd.

Adsorption filters. No. 514,722. E. R. Sutcliffe.

Compositions containing solid polymers of ethylene. No. 514,687. Imperial Chemical Industries, Ltd.

Treatment of sewage and other waste materials. No. 514,635. N. V. Mij. tot Beheer en Exploitatie van Octrooien.

Manufacture of dyestuffs of the anthraquinone series. No. 514,637. Society of Chemical Industry in Basle.

Manufacture of artificial silk. No. 514,638. I. G. Farbenindustrie A.G.

Manufacture of photographic colloids. No. 514,639. B. Gaspar.

Manufacture of oestrogenic compounds. No. 514,642. Schering A.G.

Production of polyhydric alcohols. No. 514,693. Imperial Chemical Industries, Ltd.

Production of water resistant compositions. No. 514,696. International Patents Development Co.

Manufacture of aromatic sulfonic acid chloride, sulfonic acids, and salts thereof. No. 514,711. I. G. Farbenindustrie A.G.

Stable bitumen dispersion and its use in the production of cement-bitumen grouts. No. 514,747. Colas Products, Ltd.

Photographic base sheeting and its preparation. No. 514,715. Kodak, Ltd.

Foreign Chemical Patents

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English Specifications (cont'd)

Manufacture of fungicidal preparations comprising organic compounds of mercury. No. 514,831. Lunevale Products, Ltd.
Manufacture of olefine oxides. No. 514,792. I. G. Farbenindustrie A.G.
Manufacture of vinyl halides. No. 514,795. I. G. Farbenindustrie A.G.
Manufacture of aralkylamino phenols. No. 514,796. E. I. du Pont deNemours & Co., Inc.
Manufacture of substituted perinaphthindandiones. No. 514,850. Society of Chemical Industry in Basle.
Manufacture of dyestuffs of the phthalocyanine series. No. 514,857. I. G. Farbenindustrie A.G.
Recovery of values from zinc concentrates. No. 514,858. American Zinc Lead & Smelting Co.
Textile treatment agents. No. 514,861. Imperial Chemical Industries, Ltd.
Colored bitumen dispersions and process of manufacture. No. 514,818. Colas Products, Ltd.

BELGIAN PATENTS GRANTED APRIL 28, 1939; PUBLISHED OCTOBER 9, 1939

Manufacture of polysulfides usable as fungicides which are soluble in water at moment of use. No. 433,243. F. Lienard, Tournai, Belgium.
Manure formed by combining (mixing) blood and its derivatives with products and by-products of milk, the mixture being made with acid or alkaline solvents. No. 433,267. Mme. Vve. F. Lippens, Brussels, Belgium.
Bacteriologic process for transforming town wastes into organic manure. No. 433,268. Mme. Vve. F. Lippens, Brussels, Belgium.
Saccharification of cellulose to obtain sugar solutions suitable for industrial alcohol production. No. 433,084. M. Giordani, Rome, and P. Leone, Palermo, Italy.
Manufacture of starch products by hydrolizing and enzyme action. No. 433,221 A. E. Staley Mfg. Co., Decatur, Ill., U.S.A.
Manufacture of titanium carbide by reduction of Ti ores or Ti-containing wastes in presence of Fe and an excess of C. No. 432,529. Ste. Gle. Metallurgique de Hoboken, Hoboken-lez-Anvers, Belgium.
Process for improving the physical qualities of structural steel. No. 433,006. Dortmund Hoerder Hutten-Verein A.G., Dortmund, Germany.
Improved method of refining ordinary and special steels during manufacture. No. 433,013. Low Moor Alloy Steelworks, Ltd., Low Moor, Bradford, Eng.
Rapid production of purified steel. No. 433,018. Société d'Electro-Chimie, d'Electrometallurgie et des Aciers Electriques d'Ugine, Paris, France.
Recovery of metal values. No. 433,030. Phelps Dodge Corp., New York, N. Y.
Galvanizing with Sn plus small quantities (0.1-10%) Bi, Sb, and/or Cd. No. 433,067. Remy van der Zypen & Co., Andermach-s-Rhin, Belgium.
Electrolytic production of metallic aluminum. No. 433,112. Societé Internationale des Carburantes "Brevets Consalvo" S.A., Brussels, Belgium.
Condensation of metallic vapors. Nos. 433,118 and 433,119. Ste. Ame. G. Dumont & Freres, Sclaigneaux, Belgium.
Liquefaction of zinc dust. No. 433,120. Ste. Ame. G. Dumont & Freres, Sclaigneaux, Belgium.
Electrodeposition of Ni from an acid bath. No. 433,142. The Udylite Corp., Detroit, Mich., U.S.A.
Production of low-manganese steel. No. 433,157. August Thyssen-Hutte A.G., Duisburg-Hamborn, Germany.
Purification of cyanide solutions. No. 433,217. Merrill Co., San Francisco, Calif., U.S.A.
Production of adhesive copper linings. No. 433,360. American Chemical Paint Co., Ambler, Penna., U.S.A.
Production of F-free glucinium compounds. Nos. 433,389 and 433,390. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Elimination of silicic acid from ores and analogous materials containing metallic oxides of low volatility. No. 433,391. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Production of low-C nickel by thermal decomposition of nickel carbonyl after reducing iron content to not more than 0.1%. No. 433,486. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Manufacture of mineral wool. No. 433,527. Deutsche Eisenwerke A.G., Mülheim-Ruhr, Germany.
Manufacture of cement from calcium sulfate and blast furnace slag. Nos. 432,850; 432,851; 432,854. Imperial Chemical Industries, Ltd., London, Eng.
Production of granular slag for cement manufacture. No. 432,853. Imperial Chemical Industries, Ltd., London, Eng.
Manufacture of fibrous cements. No. 432,856. Imperial Chemical Industries, Ltd., London, Eng.
Concrete cement mixed with ground magnetic iron oxide. No. 433,324. M. Beau, Paris, France.
Manufacture of cerium compounds. No. 433,407. Société de Produits Chimiques des Terres Rares, Paris, France.
Manufacture of nickel carbonyl. No. 433,039. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Manufacture of desoxycorticosterone and its esters and ethers. No. 433,044. Schering A.G., Berlin, Germany.
Manufacture of condensation products containing sulfur. No. 433,053 (see also No. 433,073). Silesia, Verein Chemischer Fabriken Saaran Krs., Schweidnitz, Germany.
Iron phosphate paint pigment. No. 433,088. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Acid cyanine dyes and use as photographic sensitizers. No. 433,128. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Manufacture of plastics from cellulose acetate. No. 433,164. Ets. Kuhlmann, Paris, France.
Thiocarbonates and imino-thiocarbonates of polyhydroxyl aromatic compounds. No. 433,209. Kalle & Co. A.G., Wiesbaden, Germany.
Tanning substances. Nos. 433,211 and 433,236. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Treatment of metal surfaces. No. 433,240. R. J. Kahn, Paris, France.
Products suitable for lacquers, paints and adhesives. No. 433,248. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Quantitative separation of hydroxylated compounds. No. 433,249. Les Laboratoires Francais de Chimiotherapie, Paris, France.
Manufacture of timber preservatives containing fluorine salts. No. 433,253. Allgemeine Holzinpragnierung G.m.b.H., Berlin, Germany.
Method of rendering incombustible substances such as lacquers, varnishes, paints, etc., by adding hygroscopic salts such as magnesium or calcium chloride. No. 433,293. J. H. C. Penners, Amsterdam, Netherlands.
Production of SnO_2 by oxidation in two successive steps. No. 433,381. S. Castellani, Florence, Italy.
Hydrogenation of coal distillation and extraction products. No. 433,395. Gewerkschaft Mathias Stinnes, Essen, Germany.
Condensation of borophenates in the presence of formic aldehyde. No. 433,404. L.C.F. Pechin, Louvain, Belgium.
Manufacture of polymerization products of formaldehyde. No. 433,441. Gutehoffnungshutte Oberhausen A.G., Oberhausen, Germany.
Manufacture of magnesium phenolates. No. 433,447. Bakelite G.m.b.H., Berlin, Germany.
Manufacture of resinous fusible condensation products from urea and solid polymerized formaldehyde. No. 433,448. Bakelite G.m.b.H., Berlin, Germany.
Manufacture of condensation products suitable for tanning and insecticides. No. 433,449. Deutsche Hydrierwerke A.G., Rodleben, Germany.
Cold decomposition of phosphate rock by treatment with 45-55% nitric acid followed by precipitation of calcium nitrate with 80-100% nitric acid. No. 433,485. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Manufacture of green sulfur-bearing dyes by treatment in fused state of leuco-indophenols prepared from 3.4.5.6-dinaphthocarbazole or a derivative and quinone chloroimide or nitrophenol, with a polysulfide, in the presence of a diluent. No. 433,496. I. G. Farbenindustrie A.G., Frankfort-a-Main, Germany.
Manufacture of calcium or barium sulfide by reduction. No. 433,499. S.A. de Materiel de Construction, Paris, France.
Manufacture of krypton and xenon from air by washing with liquid air. No. 433,522. Gesellschaft fur Linde's Eismachinen A.G., Munich, Germany.
Manufacture of ketones of the series cyclopentano-polyhydrophenanthrene. No. 433,535. Schering A.G., Berlin, Germany.
Manufacture of water-soluble injectable sulfanilamide compounds. No. 433,569. Produits Roche, S.A., Forest-Bruxelles, Belgium.

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Method of producing food products containing vitamins. No. 849,912. National Oil Products Co.
Manufacture of synthetic fibres. No. 849,812. I. G. Farbenindustrie A.G.
Manufacture of filaments, films, etc. No. 849,969. J. van den Bergh, G. J. Milo and H. E. P. Van Dijk.
Composite impermeable tissue. No. 849,909. Compagnie Industrielle de Materiel Aeronautique.
Cladding of base metals with alloys. No. 849,830. Seri-Holding S.A.
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Electrothermic production of cupro-alloys of light metals. No. 849,913. P. L. J. Miguet and M. P. Perron.
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Laminated Glass. No. 850,029. G. Desagnat.
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Derivatives of 1,4-diamino anthraquinone. No. 849,793. Societe pour l'Industrie Chimique a Bâle.
Manufacture of ketone products. No. 849,807. I. G. Farbenindustrie A.G.
Alpha-amino-acrylic acid derivatives. No. 849,822. I. G. Farbenindustrie A.G.
Manufacture of tartaric acid. No. 849,852. H. Goldstein and A. Bonn.
Manufacture of non-deliquescent dry crystalline sodium sulfide. No. 849,979. Zschimmer & Schwarz Chemische Fabrik Dolan.
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Catalytic destructive hydrogenation of heavy oils and asphaltic residues. No. 849,858. N. V. Internationale Hydro-gerreerings Octrooien Mij.
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Preparation of vinyl ethers. No. 849,862. Consortium fur Elektrochemische Industrie G.m.b.H.
Condensation product of urea and formaldehyde with a polyhydric alcohol and a polybasic acid. No. 849,925. Societe Francaise Beckacite.
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